A DICTIONARY OF DAKOTA,

CONVENIENTLY ARRANGING

A MULTITUDE OF FACTS ABOUT THE RESOURCES AND CAPABILITIES OF THE GREAT TERRITORY SOON TO BECOME TWO STATES.

4474.193

CAPITOL AT BISMARCK.

NORTH DAKOTA.

Area, 74,312 Square Miles.
Population, 250,000.
Miles of Railroad, 2,100.
No. of Post Offices, 443.
Newspapers published, 121.
No. of Public Schools, 1,362.
No. of School Teachers, 1,741.
School Expenditures in 1888, $576,569.
No. of Banks, 100.
Banking Capital, $4,000,000.
Assessed Valuation, $70,039,892.

SOUTH DAKOTA.

Area, 76,620 Square Miles.
Population, 350,000.
Miles of Railroad, 2,400.
No. of Post Offices, 607.
Newspapers published, 270.
No. of Public Schools, 2,978.
No. of School Teachers, 3971.
School Expenditures in 1888, $1.051,327.
No. of Banks, 235.
Banking Capital, $8,000,000.
Assessed Valuation, $91,381,072.

ISSUED BY
FRANK H. HAGERTY,
Commissioner of Immigration,
ABERDEEN, DAK.

JUN 29 1893

COME AND WELCOME.

There is room and a welcome in Dakota for several million more people. More farmers will create a need for more merchants and employment will be found by both for many others. In manufactures and mining, capital will require the co-operation of labor and a large number will be sustained in that way. Each Dakota will be the field for active, flourishing industries of many kinds, and will rapidly increase in population. Free information furnished by the Commissioner of Immigration.

FULL AND FREE INFORMATION.

The office of Commissioner of Immigration was established by the legislature of Dakota for the purpose of furnishing full and correct information, free to all, concerning the growth and development of the agricultural, commercial, manufacturing and mining interests of the two Dakotas. Every inquiry will receive immediate attention. Address:

FRANK H. HAGERTY,
Commissioner of Immigration,
ABERDEEN, DAKOTA.

DESCRIPTIVE MATTER.

Pamphlets, circulars, folders, papers, maps of each Dakota, etc., descriptive of North and South Dakota and containing a large amount of information of interest to home-seekers and others, will be forwarded free to any address, on request, by the Commissioner of Immigration, Aberdeen, Dakota.

A DICTIONARY OF DAKOTA.

AREA.—Dakota has an area of 150,932 square miles, or 96,596,480 acres, Texas and California only being larger in the forty-eight civil divisions of the Republic. Divided into two states, as it soon will be, North Dakota with 74,312 square miles, and South Dakota 76,620, will each be larger than any one of sixteen of the states.

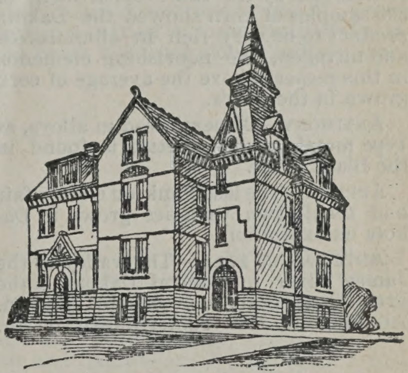
ADMISSION.—The formal existence of Dakota as a territory began on May 27, 1861, when Governor William Jayne arrived at Yankton and assumed the duties of executive. The bill providing for the territorial organization passed the senate, Feb. 26; passed the house March 1, and was signed by the president March 2, 1861. The first movement for statehood was through a constitutional convention at Sioux Falls, Sept. 4, 1883. No less than fifty measures have been introduced in congress having in view the admission, in part or whole, of Dakota into the grand family of states. July 4, 1889, constitutional conventions for North and South Dakota met respectively at Bismarck and Sioux Falls, preparatory to the final act of admission in October by presidential proclamation.

AGATES.—Many beautiful specimens of both the moss and striped varieties have been found in various parts of the territory.

AGRICULTURE.—Though so recently a part of the "Great American Desert," Dakota takes a high rank among the agricultural states. In North Dakota large areas are devoted to the raising of wheat. In South Dakota more diversity is found, with corn as staple as wheat in the North. In both sections stock raising and dairy farming are becoming important and growing interests.

AGRICULTURAL PRODUCTS.—These include all the products of the north temperate zone, notably cereals and vegetables. The climate and soil favor the growth of all the small grains, wheat in particular being the best grown in the world. The flax, oats, barley, rye and buckwheat produced are all of superior quality. A single crop of wheat or flax has frequently paid for a farm and improvements. Corn is a staple in South Dakota, but hard varieties do well in the North.

AGRICULTURAL COLLEGE.—The Dakota college is one of the best equipped, in teachers and branches taught, of any in the country. It is located at Brookings, South Dakota, the permanent improvements having cost over $100,000. Congress has provided a large endowment of land for a similar institution in North Dakota, and one will soon be erected.



MAIN BUILDING, AGRICULTURAL COLLEGE, BROOKINGS.

ALFALFA, one of the most valuable of forage plants, grows with unusual success throughout both Dakotas. It is a plant peculiar to dry climates and will stand greater extremes of heat and cold than any other.

ALKALI is dangerous only in the minds of eastern people, who know nothing about it. It is not palatable as a regular diet, but it is a valuable element in the the soil in the composition of grains, and helps to give Dakota a reputation for growing the best wheat in the world.

ALTITUDE.—The altitude of Dakota above sea level ranges from 800 feet in the Red River valley to 2,000 on the high prairies between the large rivers, the average of the territory being about 1,500 feet.

ANIMALS.—Among the wild animals the elk, deer, bear and antelope are yet found. The moose is occasionally met with, but the buffalo which once roamed the prairies in countless numbers, cropping the rich native grasses, is extinct. Smaller game, the rabbit, fox, wolf, squirrel, mink, beaver, skunk, otter, marten, badgers, gophers and other fur bearing animals exist in numbers in many localities, and furnish work and sport for trappers and hunters.

ANALYSES.—(1) The chemist of the national agricultural department made analysis of 2,759 samples of wheat from all parts of the world and found those from Dakota (No. 1 hard) to possess the two important points of dryness and richness in albuminoids to a degree not equaled by any other. (2) The result of analysis by the same department of 290 samples of corn showed the Dakota product to be very rich in albuminoids and nitrogen, the nourishing elements, in this respect above the average of corn grown in the states.

ANTIMONY.—Mineral used in alloys, as type metal and bell metal, is found in the Black Hills.

APPLES.—The last Yankton county fair had ninety-two varieties grown in Dakota on exhibition.

ARTESIAN WELLS.—The valley of the James River, in Central Dakota, is the greatest artesian well district known. Alluding to this subterranean ocean. scarcely untouched for its destiny, Hon. S. S. Cox, in his Fourth of July address at Huron, said:

> "The water power of your matchless valley is as yet immeasurable by ordinary mechanical standards. It is so prevalent that your people will utilize its specific gravity for the diversity of their industries. When its undiminished flow and steady pressure from the bosom of the earth are properly harnessed by mechanism, it will give its lucid lymph to make grasses for stock, and lawns for beautiful homes. Its sunless currents, through the ingenuity of man, will enhance the rich soil by quenching its thirst. Fabulous are the wasted energies of your water power, as we count it by the standard horse-power of mechanics; but still more marvelous are the rea energies of the soil which it would fructify.
>
> "The beautiful and fruitful valley of the James may not be as redolent of historic association and traditions as another James river of colonial days; but deeper than historical or traditional incident are Dakota's pure springs under a magic more enchanting than that of Aladdin, which leap from your modern Artesium."

Artesian wells are found in all parts of Dakota, but those in the valley of the James are notable for having the heaviest pressure and greatest volume of any in the world.

ASBESTOS, or mineral wool, is found in the Black Hills. It is unaffected by fire, and is employed in the manufacture of safes, clothing, lamp-wicks, and in other ways.

BARLEY has become a standard crop, because of its brightness and hardness, being specially adapted to the manufacture of pearl barley, in the making of which the territory offers unsurpassed advantages. The yield last year was about 7,000,000 bushels.

BANKS.—Dakota has a banking capital exceeded only by ten of the older states. There are over 400 banks in the territory, a majority in the south state. There are 57 national banks, 25 in the north and 32 in the south.

BARYTA, the heaviest of mineral earths, exists in the Black Hills.

BAD LANDS.—This is a region—30 by 60 miles—along the Little Missouri river in Western Dakota where the clay has been worn into fantastic forms by the action of water, wind and fire. Mounds stand up in regular form like pyramids, and others assume many marvelous shapes, curiously banded with colors due to fire from burning coal beds, some of which are still on fire. The valleys are covered with grasses which supply large herds of cattle and horses. The Northern Pacific railroad runs through this singular region. There is also a district known as the "Bad Lands" along the White river in Southwestern Dakota.

BERRIES, of wild varieties, are found along the rivers and lakes. Strawberries are often so abundant that their sweet juices color the ground when crushed by the feet of moving herds. Tame varieties are cultivated in all parts of the territory.

BIRDS exist in variety, and eastern taxidermists get their supplies in this section.

BLUE GRASS will grow anywhere in Dakota.

BLIND.—These unfortunates are educated at territorial expense in the Iowa State school.

BLIZZARDS.—A mere word often frightens. A blizzard is a term applied to a winter storm in which the wind fills the air with dry snow, driving it hither and thither over the broad prairies, a contingency not common in the east, where the country is wooded and fenced and the snow, heavy and damp, drifts higher than was ever known in Dakota. The blizzard is usually much worse in the eastern newspapers than it is in Dakota.

BOARD OF HEALTH.—A territorial board of health acts in conjunction with local boards in the various counties to suppress contagious diseases and prevent the practice of medicine by persons not qualified.

BULBOUS PLANTS, as onions, turnips, beets, etc., attain large size and excellent flavor throughout Dakota.

BRICK MAKING can be carried on in almost any part of the territory.

BUCKWHEAT can be raised anywhere in Dakota.

BUILDING STONE is found in many parts of the territory, in granite boulders, and in quarries in the Turtle mountains, along the Big Sioux river, and in the Black Hills, in the latter taking the form of marble and sand stones.

BUILDING MATERIAL is easily and cheaply had in all parts of Dakota, the lumber coming from the great forests of Minnesota and Wisconsin, and stone is well scattered over the territory. Lumbering is carried on quite extensively in the Black Hills and along the Red river.

CEMENT, equal to the Portland article, is made from chalk rock and blue clay in Yankton county.

"CHINOOK WINDS."—This is the Western name for a breeze from the Pacific ocean, which sweeps through the depression in the Rocky mountains in Montana and melts the snow and ice in Dakota before the sun performs that service in Iowa and Nebraska. The ice is usually out of the Missouri river at Bismarck before it is at Sioux City and Omaha.

CHURCHES.—The population of Dakota, though drawn from many diverse sources, has more of the religious element in it than is generally found in the west. Most of the colonies in the territory are founded on religious principles, particularly the Mennonites, the Germans and the Scandinavians, who often bring a pastor with them. The Eastern immigrant manifests his remembrance of early life by promptly establishing schools and churches. The following religious bodies have established themselves in the territory:

Adventist,
Baptist,
Christian,
Congregationalist,
Episcopal,
Friends,
Hebrew,
Lutheran.
Methodist Episcopal,
Presbyterian,
Reformed Presbyterian,
Roman Catholic,
Swedish Baptist,
United Brethren,
United Presbyterian,
Universalist,
Unitarian,
Wesleyan Methodist.

Several of the organizations are so strong that they have divided North and South. The Episcopals have two bishops, the Catholics will soon have two, the Methodists have two conferences, and the Presbyterians, Congregationalists and Baptists are divided into North and South governing bodies. Dakota affords religious and social privileges equal to those of older and more populous states.

CITIES.—Dakota is noted for its number of active cities and towns. The following are the principal places, with estimated population:

NORTH DAKOTA.		SOUTH DAKOTA.	
Bismarck	3,500	Aberdeen	6,500
Casselton	1,500	Brookings	2,000
Devils Lake	2,000	Canton	2,000
Ellendale	1,200	Chamberlain	2,000
Fargo	10,000	Deadwood	4,500
Grafton	2,500	Hot Springs	1,000
Grand Forks	7,000	Huron	5,000
Jamestown	3,500	Madison	1,600
Lisbon	2,000	Mitchell	4,500
Mandan	2,500	Pierre	2,000
Minot	1,200	Plankinton	1,500
Pembina	1,200	Rapid City	5,500
Valley City	1,500	Redfield	1,800
Wahpeton	2,000	Sioux Falls	10,000
		Watertown	5,000
		Woonsocket	1,000
		Yankton	5,000

CLIMATE.—The superiority and advantages of Dakota's climate are not fully understood by even the residents. It is a fact that the winters here do not cause the suffering from cold that the temperature would seem to indicate. Dry air is a poor conductor of heat, while air charged with moisture rapidly takes away animal heat, and produces those chilly and benumbed sensations so common to the Eastern and Southern states. Dakota is distant from the oceans, and its winter air contains but little dampness, which accounts for the ease with which dwellings can be kept warm, the homesteader keeping comfortable in his board shack, while the people of the lower latitudes shiver around blazing fires. There are more bright sunny days in the Dakota winter than anywhere east of the Mississippi river. The crisp and exhilerating air gives the human and animal life a vigor, energy and happiness not possible in a humid atmosphere. The summers of Dakota are about the same in temperature as the North of Europe and the British islands. (See temperature). To get a correct idea of the beauties of our climate live in it until all homesickness is eliminated and then go back and spend a fall, winter or spring in the raw air, mud, fog, the freeze, thaw and sneeze—and general discomfiture of the East and South. The climate of the plains is changing, not year by year, but periodic, and tidal, it ebbs and flows, and must be measured by decades and not by years. Moist waves of several year's duration, carrying forward the tide of settlement, are followed by dry seasons when part of the ground gained is lost, but recovered and the tide of population rolled still further on during the moist seasons on their periodic return. The entire plains country will eventually be subjected to human use. All of Dakota is gradually being included in the safe agricultural rain belt.

CLAYS for the manufacture of brick, hollow ware, terra cotta ware, etc., are found in various parts of Dakota.

CLOVER grows in Dakota.

COPPER is found in many parts of the Black Hills, in the form of sulphide ore, carbonates and oxides.

COAL.—There is enough in Dakota to supply the whole country. It is found in large quantities in the Black Hills and in Western Dakota, along the Northern Pacific road where the veins vary from a few inches to twelve feet. There are large exposures along the Missouri, Mouse and other rivers. At 70 pounds to the cubic foot a vein 6 1-2 feet thick would yield 9,900 tons to the acre, or over 6,000,000 tons to the section. It is the brown or lignite variety.

COLONIES.—Quite a number of prosperous and growing American, German, Scandinavian and German-Russian settlements have been made in Central and Western Dakota.

CONSTITUTIONS embodying the results of the brightest and broadest statesmanship of modern civilization will be adopted by the two Dakotas this year.

COUNTIES.—Dakota contains 132 counties, divided as follows: North, 52; of which 14 are unorganized; South, 79; of which 29 are unorganized. Following is the list and assessed valuation of the organized counties:

SOUTH DAKOTA.		NORTH DAKOTA.	
Counties.	1888.	Counties.	1888.
Aurora	$1,380,053	Barnes	$3,285,659
Beadle	5,656,399	Burleigh	3,514,572
Brown	7,586,308	Benson	723,723
Brookings	2,395,269	Bottineau	346,328
Buffalo	200,439	Billings	249,137
Brule	1,318,963	Cass	10,911,411
Bon Homme	2,183,122	Cavalier	572,583
Butte	461,370	Dickey	1,982,570
Custer	544,488	Eddy	612,103
Campbell	425,431	Emmons	745,739
Clark	1,716,587	Foster	978,787
Codington	2,669,350	Grand Forks	5,139,409
Charles Mix	617,295	Griggs	1,625,480
Clay	2,158,311	Kidder	2,053,190
Day	982,041	La Moure	2,011,953
Douglas	1,026,592	Logan	1,013,696
Deuel	1,059,025	Morton	2,399,135
Davison	1,593,487	McHenry	180,898
Edmunds	1,450,452	McLean	732,950
Fall River	579,581	McIntosh	470,202
Faulk	1,196,202	Mercer	326,849
Grant	1,351,617	Nelson	1,305,232
Hamlin	933,878	Oliver	532,463
Hand	1,759,272	Pembina	2,751,971
Hanson	1,109,656	Pierce, just org'd.	
Hughes	1,419,721	Richland	4,310,356
Hutchinson	2,851,651	Ransom	2,573,751
Hyde	792,199	Ramsey	1,977,158
Jerauld	664,219	Roulette	354,815
Kingsbury	1,475,283	Stark	1,116,660
Lake	2,397,267	Stutsman	2,738,322
Lawrence	4,631,888	Steele	1,915,210
Lincoln	2,822,865	Sargent	1,541,401
McCook	1,418,495	Traill	3,549,719
McPherson	687,830	Towner	362,612
Marshall	774,778	Walsh	4,153,255
Meade, just org'd		Ward	239,112
Miner	1,265,362	Wells	741,479
Minnehaha	7,865,112		
Moody	2,053,870	Total	$70,039,893
Pennington	2,205,351		
Potter	785,744		
Roberts	482,087		
Sanborn	1,240,178		
Spink	3,920,953		
Sully	1,097,371		
Turner	1,912,682		
Union	2,595,150		
Walworth	499,107		
Yankton	3,166,721		
Total	$91,381,072		

The total valuation of the whole territory being $161,420,965 in 1888, an increase of over $130,000,000 in eight years.

COTEAUX.—This is a term from the French as applied to the series of little hills in the plateau between the Missouri and James rivers, and between the James and the Minnesota state line. Both are regions of geological interest, and swarm with game during the season. Grass is very abundant among these hills.

Corn is a common field crop in South Dakota and flint varieties are raised in the north, as high as sixty bushels to the acre. The crop of 1887 was nearly 25,000,000 bushels, or over forty to every inhabitant. A few years ago it was said that corn would not grow in Dakota.

Cost of Living.—The cost of living is no greater in Dakota than in the agricultural states of the Mississippi. Farmers can raise everything except groceries and clothing and these can be had at any market town at average eastern prices.

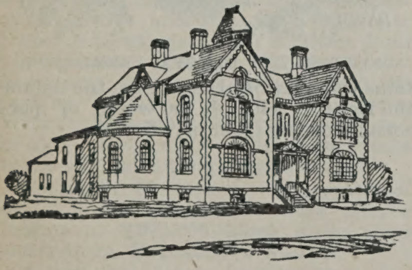
Commerce.—The maps show how the territory is gridironed with railroads belonging to the greatest systems in the country. And the mighty Missouri is navigable for quite a thousand miles inside the territory. The Red river of the North is also navigable.

Cottonwood. — This tree, so long thought of little value, is coming into popular use for making fruit and vegetable shipping boxes. It is one of the most rapid growing trees in Dakota and attains large size; at many places along the Missouri river it is found from four to eight feet thick.

Cyclones.—Of 237 cyclones described in a recent report of the U. S. signal service, not one was located in Dakota, but Minnesota felt the destructive force of 17, Iowa 31, Missouri 44, Illinois 54, and Kansas 62.

DAKOTA, or Dakotah, is an Indian word, signifying leagued or confederated, as applied to the union of the various tribes of the Dakotah or Sioux Indians.

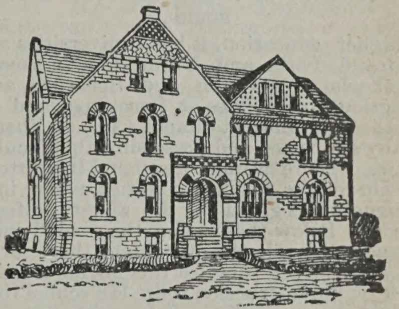
Dairying.—The movement towards butter and cheese making is wide-spread. Reports of the establishment of creameries and of an occasional cheese factory are on the increase. Most of them are organized on a liberal scale and the work entered upon with all the energy that Dakota men usually give to enterprises which promise to be of public good. Dairy products will soon present quite a figure in the statistics of our great commonwealth.



SCHOOL FOR DEAF MUTES, SIOUX FALLS.

Deaf Mutes are educated in a splendid institution at Sioux Falls.

Dentistry.—The practice of dentistry is regulated by law, practitioners being required to appear before a Board of Dental Examiners. There are 114 registered dentists in the territory.



DORMITORY, SCHOOL FOR DEAF MUTES.

Delegates.—Dakota has been represented in congress by the following:

J. B. S. Todd	1862-64	G. S. Bennett	1879-81
W. F. Burleigh	1864-69	R. F. Pettigrew	1881-83
S. L. Spink	1869-71	J. B. Raymond	1883-85
M. K. Armstrong	1871-75	Oscar S. Gifford	1885-88
J. P. Kidder	1875-79	Geo. A. Matthews	1888—

Devils Lake.—(See North Dakota.)

Dust is not as troublesome in Dakota as it is in the Rocky mountain country and on the Pacific coast.

Don't.—Do not come to Dakota with an idea that you can make a living without work.

EDUCATIONAL ADVANTAGES.—Dakota made ample provisions from the first for the education of its children and youth. Beginning with higher education, it has universities at Grand Forks and Vermillion; normal schools at Madison and Spearfish, an agricultural college at Brookings, and a school of mines at Rapid City, all liberally supported and possessing able faculties. There are also Teachers' Institutes held in the various counties, where instruction is given by the ablest professors. Below these come the graded and ungraded schools, of which there are nearly 5,000. Besides this liberal course of public instruction there is a school for deaf mutes at Sioux Falls, with provision for the education of the blind in the Iowa school, while neglected, wayward and vicious children are cared for in a reformatory at Plankinton. There are also ten or twelve colleges, and various academies and seminaries, mostly under control of various religious bodies, in different parts of the territory and all ranking high in their special fields. Is it not wonderful that Dakota, so recently a part of the "Great American Desert," expended in the last five years the large sum of $10,575,117 for public schools?

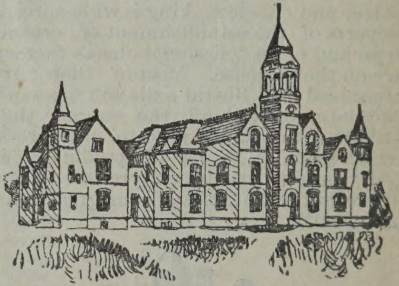
UNIVERSITY OF NORTH DAKOTA, GRAND FORKS.

EGGS can be made the source of a nice income on every farm, besides furnishing the family with plenty for table use.

EMPLOYMENT is easily obtained by good, industrious men on the farms, in the shops, on the railroads and in the trades.

ENERGY IS MONEY.—An old settler says it is a mistake that men without money are without the means required for settlement on free lands in Dakota. Every man with energy, muscle, nerve and good sense has the means. He can make a living out of the ground much easier than the man of fifty years ago who packed corn on his back miles away to mill or beat it to meal with a pestle of stone.

EXEMPTION.—Under the homestead law a claim of 160 acres is exempt from any debt, the territory also exempting a farm not to exceed 160 acres or six acres within a town plat, and in like manner the family pictures, a church pew, a burial lot, and books not exceeding $100 in value, all wearing apparel, and one year's provisions for debtor and family are absolutely exempt from seizure In addition to the above exemptions the territorial laws give the debtor the right to select $1,500 worth of personal property from his effects.



UNIVERSITY OF DAKOTA, VERMILLION.

FARMERS' ALLIANCE.—This organization has become a strong one, extending its usefulness beyond meetings for mere talk and exchange of local opinions, into co-operative insurance and merchandizing with signal success.

FACTORIES.—There are fine openings

in Dakota to manufacture linseed oil, binding twine and oil cake, straw paper, crackers, and many other articles, owing to the abundance of raw material.

FAIR ASSOCIATIONS.—Both Dakotas have district or state associations, besides many county societies, all of which hold creditable exhibitions.

FENCES.—A great expense incident to farming is dispensed with by a general law in Dakota, except in the Black Hills, and that is fencing. The law requires stock to be herded.

FINANCES.—The financial standing of Dakota is at the highest point. Territorial and county bonds have sold this year at a premium of from 3 to 6 per cent.

FIRST SETTLEMENT.—The first actual settlement by white men within the present limits of Dakota was at Pembina, on the Red River, in 1780, by French fur traders. In 1812 Lord Selkirk built a fort at Pembina. Various fur companies had posts along the Red, James and Missouri for fifty years before the organization of the territory. The first attempt at white settlement in South Dakota was at Sioux Falls in 1856, but active settlement did not begin for two years later.

FISH.—The numerous rivers and lakes of the territory are well stocked with fish, mostly of the edible varieties and in the Black Hills there are some excellent trout streams.

FLAX.—This is one of the profitable crops of Dakota. A single crop from the sod has been made to pay for a farm and improvements. The fibre is of unusual excellence, while the seed is oily to a degree unknown back East. Dakota leads the country in production, two yields last year approaching 4,000,000 bushels.

FLORA.—The indigenous flora of Dakota is a combination of the Canadian or sub-Alpine and the Appalachian or Upper Mississippian. No northern land has a greater variety of wild roses, and from early spring to late autumn the prairies bloom with dainty flowers. Wild fruits reach great perfection, and in time, with right adaptation, tame fruits will be cultivated with success.

FORESTRY STATISTICS.—The national census report places the forest area of Dakota at 3,000,000 acres more than either Iowa, Nebraska or Kansas.

FOREIGNERS.—Our foreign born citizens are, as a rule, as public spirited and enterprising as the American born, and as temperate and law abiding. Their perseverance and unflagging industry has contributed much to building up the material, as well as moral and intellectual standing of the territory.

FOSSIL BONES of extinct races of animals are found in large quantities near the White river, in Southwestern Dakota, so numerous indeed, that scientists have designated it as "the bone-yard of the continent."

FREE HOMES.—Every man and every woman, too, who is unmarried, widowed or deserted, enjoys the three rights of public land entry under the homestead, pre-emption and timber culture acts and can become the owner of 480 acres of fertile soil by complying with the provisions of these laws, which mark the most wise and beneficient disposition of public land by any government. Dakota has millions of acres of vacant lands. Some one has said that no man has a home until he owns one. Dakota extends a friendly hand to the landless, the homeless, and all who eke out a bare existence on rented farms or as laborers in the East or old world. The peaceful ease and rapidity with which the land of Dakota is being brought into use, is remarkable. Favorable government, climate and soil are inducements, but the price of the farm is a prime consideration. The land is free. The intending settler can come to Dakota in a colonist sleeper, a palace car, or a common coach, and take up free lands within the sound of the engine whistle. There is no uncertainty in coming to Dakota, the reputation of its products has been established.

FREIGHT RATES.—All the railroads running into Dakota make very low car and pound freight and passenger rates to settlers.

FRUITS of wild varieties growing in such profusion and such excellence is guarantee of the adaptability of the territory to the culture of fruit.

FROST.—The period of exemption from frost varies from four to five months, which allows time for the perfection of annual crops.

FURS.—There are many fur-bearing animals still remaining. The business of gathering furs was once large and profitable.

FUEL.—This is a matter of no great concern, as coal is cheaper at the railroad stations than in Nebraska or Kansas, owing to the nearness of Duluth, the great coal port of Lake Superior. Besides Dakota has thousands of square miles of coal beds of her own. Trees, too, grow rapidly, and any industrious man can soon have plenty of wood.

GRASSES.—All the tame grasses and forage plants do well. Clover has been tested in many localities and the verdict is in its favor. Timothy, too, does well, and so does blue grass. The wild grasses are peculiar in that they cure uncut, and stock can feed from standing hay.

GARDENS.—The soil of Dakota is peculiarly adapted to gardening, being flexible and easily worked.

GAME LAW.—Deer, antelope and prairie chickens may be killed from Sept. 1 to Dec. 31; wild duck, snipe, goose, brant, plover, and curlew from Sept. 1 to May 15. Violations are punished in fines ranging from $2 to $10 for each bird or animal killed. Fishing is prohibited with anything except hook and line. Pike, perch, pickerel and muskallonge may be caught from May 1 to Jan. 31. This restriction does not apply to the Missouri and Red rivers. Violations punishable by fines ranging from $15 to $100.

GEOLOGY.—The geological structure of Dakota includes formations ranging from the Archæan to the fresh water Tertiary. The ancient rocks were ground to powder by action of the ice during the glacial age, their chemical ingredients now forming the soil which produces such perfect vegetation. The Black Hills offer a fine field for the student, on account of the regularity of the upheaval, in which can be seen all the formations, from the most ancient to the latest.

GEOGRAPHY.—Dakota is located on the northern boundary of the United States, about midway between the oceans and the gulf and Hudson's bay, in the head of the North American continent. Its southern boundary is the 43d parallel of north latitude, which separates it from Nebraska, its northern boundary being the 49th parallel, which separates it from the British territories of Manitoba and Assiniboia, barely half way between the equator and the north pole. The eastern boundary is formed by the Red and Bois de Sioux rivers, Traverse and Big Stone lakes, the Greenwich meridian of 96 degrees and 20 minutes west, and the Big Sioux river, which separate it from Minnesota and Iowa. The western boundary is the Greenwich meridian of 104 degrees or the Washington meridian of 24 degrees, which separates it from Montana and Wyoming. The southern boundary is on the parallel of Detroit, Mich., Boston, Mass., and Rome, Italy, while the northern boundary is about the parallel of Paris, France. Its extent from north to south is 430 miles, from east to west about 360.

STATE NORMAL SCHOOL, MADISON.

STATE NORMAL SCHOOL, SPEARFISH.

GLASS SAND is found in the Black Hills and elsewhere.

GRANERY OF AMERICA.—The world is coming to know that Dakota is the wheat granery of the United States. While the crop of 1888 was smaller than that of 1887, the increased price in 1888 more than compensated for the shortage. The following shows the products, acreage and value of the field crops of Dakota in 1888:

	Bushels.	Acres.	Value.
Wheat.......	40,500,000	3,847,833	$40,450,000.00
Oats.........	30,480,574	1,111,574	9,122,575.50
Corn	22,068,680	615,055	7,627,472.00
Barley.......	4,000,000	197,982	1,600,000.00
Rye..........	300,000	16,378	148,951.00
Buckwheat..	55,000	3,907	50,971.00
Flax	3,300,000	329,288	2,963,247.00
Potatoes.....	5,200,000	40,982	3,120,000.00
Total.....			$65,083,216.50

GOVERNORS.—The Territory of Dakota has had the following chief executives:

William Jaynes	1861–63
Newton Edmunds	1863–66
Andrew J. Faulk	1866–69
John A. Burbank	1869–74
John L. Pennington	1874–78
William A. Howard	1878–80
Nehemiah G. Ordway	1880–84
Gilbert A. Pierce	1884–87
Louis K. Church	1887–89
Arthur C. Mellette	1889—

GOLD.—The gold stamp mills in the Black Hills are the largest in the world, and are at work on the largest veins fo ore known. The ore is low grade, but exists in such quantities that the business of reducing it is permanent. The output of gold from the Hills in ten years exceeds $35,000,000, and gives Dakota fifth rank in the Union as a gold producer.

GYPSUM, from which the best grade of plaster of paris is made, exists in boundless quantities in the Black Hills; enough to supply the whole country. It also makes a fertilizer on certain soils.

HEALTH—The climate of Dakota commends itself to persons suffering from pulmonary and malarial diseases. The statistics of the census of 1885 showed a mortality rate of 5 1-2 to 1,000, or 1 in every 183 of the population, as against 15 to 1,000 or 1 in every 66 of the population of the entire country.

HAY.—There never was a time, no matter how the weather affected the field crops, that there was not plenty of wild grasses, which sun-cured on the ground, made nutritious feed.

HORSE-BREEDING is becoming an important industry. Dakota horses are possessed of more lung power and muscular endurance than those raised in the east.

HORTICULTURE.—The territory has a horticultural society, the work of which means better gardens, better orchards, better forestry, and a hastening of the climatic changes which only an improvement in the vegetable growth can bring about.

HUNTING.—During the season no part of the republic offers a greater variety of game. On the prairies are to be found numerous members of the grouse family, while along the streams and lakes gather millions of geese, brant, ducks and other water fowl. In the fields after harvest the geese settle down in such enormous numbers that the ground for acres seems to be covered with snow. In the timbered sections large game is found. The rivers and lakes afford plenty of fishing. See game law

HOT SPRINGS.—These natural earth heated waters are found in the Black Hills, and have become a place of much resort. As adjuncts in the treatment of rheumatism and other chronic diseases, they have a reputation extending back into early Indian history.

HOPS.—Hops grow wild in the groves along the principal rivers.

HISTORY.—What is now Dakota was little known 100 years ago. It was first included on the map as apart of Louisiana, and like much of the country west of the Mississippi was supposed to be a desert. From 1805 to its organization as a territory in 1861, it served in whole or part as sections of the territories of Missouri, Michigan, Wisconsin, Iowa, Minnesota, Mandan and Nebraska. When organized it reached from Minnesota to the Rocky Mountains, but in 1863 Idaho was cut off and in 1864 the east half of Idaho was organized into Montana, and in 1868 Wyoming was clipped off, but enough was left to make the largest territory in the Union, and which in this year of our Lord, 1889, will be formed into the two great states of North and South Dakota, with constitutions as progressive, broad and liberal as our citizenship is intelligent and enlightened, as our acres are fertile and our climate healthful.

And yet it is young, this giant West, its glories just begun,
Its tides of empire surging yet toward the setting sun,
Where now are sparsely scattered homes, the coming years shall see,
Two mightier states than worlds have known in these soon to be.
When every wonderful resource, compelled by earnest hands,
Shall yield their treasures to the countless multitude's commands.

INDUCEMENTS.—Dakota holds out greater inducements at this time for all persons with limited capital but plenty of nerve and energy, than any other country on the great round globe. The soil is new and productive, land is to be had for the occupancy, and the climate is the most health-giving in the world. No new region can show a greater number of examples of success from small beginnings than Dakota. Send to the commissioner of immigration for official information.

Insects.—Dakota is not bothered with insect pests, destructive to crops and annoying to animal life, as in the East, South and the Pacific coast.

Invalids will find the Dakota air very beneficial, if not curative, to all pulmonary troubles.

Insane Hospitals are maintained at Yankton for South Dakota and at Jamestown for North Dakota. Both are well managed institutions.

Institutions.—Dakota has not less than $2,000,000 invested in the following public institutions:

Agricultural College	Brookings.
University of North Dakota	Grand Forks.
University of Dakota	Vermillion.
Normal School	Madison.
Normal School	Spearfish.
School of Mines	Rapid City.
School of Deaf Mutes	Sioux Falls.
Capitol	Bismarck.
Dakota Penitentiary	Sioux Falls.
North Dakota Penitentiary	Bismarck.
North Dakota Hospital for Insane	Jamestown.
Dakota Hospital for Insane	Yankton.
Dakota Reform School	Plankinton.
Soldiers' Home	Hot Springs.

Interest.—The legal rate of interest is 7 per cent, but 12 is allowed on contract.

Indebtedness.—The indebtedness of the territory is a little over $1,000,000, or $1 in every $350 of the true value of all property.

Indians.—There are nine reservations covering 41,948 square miles or 26,847,105 acres, inhabited by 30,076 Indians. Land is being rapidly allotted in severalty, and it will not be long before the reservation system will disappear. Many of the Indians have abandoned their old customs, more than four-fifths of them having already donned the clothing of the whites. There are over 70 schools maintained on the reservations. The Sioux reservation, occupying more than half of the total, will soon be opened to white settlement.

Iron.—The most useful of metals, the only one that can be welded, is found in the Black Hills, in quantities sufficient to supply the nation.

Iridium.—One of the heaviest of known metals, is found in the Black Hills.

Irrigation as a rule is not needed in Dakota, but in view of occasional drouthy seasons the question of being able to regulate the amount of moisture needed by the growing crops by means of irrigating canals—supplied from artesian wells, rivers and storage reservoirs—is under serious consideration. While the rainfall is sufficient it does not always come at seasonable times. Had the farmers of Dakota been able to water their fields this year their crops would have been enormous instead of being merely fair. By tapping the artesian basin and utilizing the flow of rivers, the fields of Dakota could be made to rival those of the Nile in productiveness. This artificial supply of water would not only produce wonderful crops of grain, but vegetables, grasses, forage plants, small fruits and trees would spring forth in plenty, covering the face of the country with orchards and groves, and giving character and beauty to the landscape not possible now without great labor.

JAMES RIVER VALLEY.—(See North and South Dakota.)

Jasper.—This stone is of various colors, red, yellow, green, etc., being an opaque variety of granite and is susceptible of a fine polish. It is found along the Big Sioux river and occurs in boulders, scattered over the territory, in the form known as "Cats-eyes."

Jewelry.—The good color of the Black Hills gold makes it popular with manufacturers for use in jewelry.

KNOWLEDGE of Dakota will correct many wrong notions eastern people have concerning its supposed disadvantages.

King of Grains.—No. 1 hard wheat, one of the great cereal crops of Dakota. Millions of bushels are raised annually and sold at good prices.

LAND OFFICES.—There are ten public land offices in Dakota, located as follows:

SOUTH DAKOTA.
Aberdeen,
Deadwood,
Huron,
Mitchell,
Watertown,
Yankton.

NORTH DAKOTA.
Bismarck,
Devil's Lake,
Fargo,
Grand Forks.

There is more vacant land in the Bismarck district than in all the others combined.

Lakes abound, principally in the eastern half, the largest, Minnewaukon, or Devil's Lake, covering 100 square miles. All the lakes afford the best of sport in fishing and hunting in season.

Length of Seasons.—There is no appreciable difference between Dakota and the New England states in the length of the seasons.

Legal Holidays.—New Year's day; Washington's birthday, Feb. 22; Decoration day, May 30; Independence day, July 4; Arbor day; Thanksgiving day; general election day, and Sundays.

Lucerne.—(See Alfalfa.)

Lead is one of the many products of the Black Hills.

Live Stock Statistics.—The number of head of live stock on the farms and grazing ranges of Dakota, according to the report of the National Department of Agriculture for February, 1889, is as follows: Total number, 2,030,558 head, valued at $49,426,961, comprising 1,052,935 head of cattle, of which 239,057 were milch cows and 813,878 other cattle; 264,581 horses; 16,850 mules; 242,117 sheep; and 453,875 hogs.

Lime is made at a number of places in Dakota.

Limitation of Actions.—Judgments, twenty years; notes and open accounts, six years.

Lint Plants, as flax, hemp, etc., come to perfection only in the cooler climates, and of course do well in Dakota.

Local Option.—A petition from one-third of the legal voters of any county is the authority for the commissioners to submit the question of prohibiting the sale of liquor, a majority vote only being necessary to decide for or against.

MARKETS for farm products are to be found in all the towns of the territory, and the great cities of the northwest are quickly and cheaply reached.

Manufactures.—There is no better field for investments in manufactures than in Dakota. We have wool and flax, we have cattle, sheep and hogs, and we have wheat and corn. We have nearly all the minerals known to geologists. We need more flouring mills, we need packing houses, we need flaxseed oil and oat meal mills, we need woolen factories, we need wood working shops, implement factories, iron foundries and machine shops. There is room for legions of capitalists and workers.

Malarial Diseases do not originate in Dakota, nor do asthma, bronchitis, catarrh and consumption have their genesis here.

Meat Packing Houses should be established in the midst of growing herds throughout Dakota.

Melons, of all varieties, instead of

throwing growth into vines, come late, but are rich in saccharine and aromatic flavor.

Mica is an abundant mineral in the Black Hills and is being quite extensively mined.

Mineral Springs of more than local reputation are found in the Black Hills and in the Turtle mountain country.

Militia.—The local military force of the territory consists of twenty companies of infantry, (two mounted) and one of artillery.

Missouri Valley.—(See South Dakota.)

Millet can be grown with as great success in Dakota as in the East.

Mountains.—There are two mountainous regions in Dakota, the Black Hills in the southwest and the Turtle mountains in the north, the former covering 3,200 square miles, and the latter about 800. Harney Peak, the highest of the Black Hills, is 8,200 feet above the sea; while Butte St. Paul, of the Turtle mountains, is only 2,300 feet. Both regions are heavily timbered, the former with pine and the latter with oak, birch, etc.

Mouse River Country.—(See North Dakota.)

Money can be invested now to great advantage in all parts of Dakota in real estate, in banks, in stock raising and in commercial and manufacturing enterprises.

Morals.—It is gratifying to know that none of our newer states entered the Union with a more deserved reputation for good order, safety of person and property, general intelligence and morality in its highest and purest sense, than will the Dakotas. It will be a safe body of voters that is to be admitted from the coming new states, where the insanity of anarchism and the sophistries of socialism have no hold; where wealth is not worshipped and social rank or caste not established.

Mules.—The raising of mules is being engaged in with great profit in Dakota. It takes no more trouble to rear a good mule or horse than a steer, and either is worth a good deal more money.

NATIONALITY. — In population nearly every country of the earth is represented. Those who think that Dakota is populated by ignorant foreigners and lawless Americans will be surprised to learn that the territory supports more churches, schools, newspapers, banks, and other civilized agencies per capita than any one of three-fourths of the states. It has a smaller prison population than any state in the Union, and ranks fifth in having a larger proportion able to read and write. The federal census of 1885 showed an American population of 65 per cent., North Dakota's proportion being 58 per cent., South Dakota 72. In the north Scandinavians and Canadians lead, in the south Scandinavians and Germans.

Natural Gas has been found in at least three districts in Dakota. In Sully county, South Dakota, and in Cass and Stutsman counties in North Dakota.

Natural Curiosities.—The most remarkable of these are the grotesque formations of the Bad Lands, the fossil bones of monster animals along White river, the warm springs and petrifactions in the Black Hills, ancient Indian mounds at Devil's Lake, and the falls and palisades of the Big Sioux river.

Newspapers.—Dakota has nearly 400 newspapers, collectively constituting a splendid exhibit of what are popularly regarded as among the strongest forces in the educational and moral progress of the territory. Dakota has more publications than Minnesota, her neighbor on the east, and more than any one of twenty-four states out of thirty-eight, on the list for 1888. Dakota has more than twice the number of newspapers published in Alabama, Mississippi, Maryland, Arkansas, Maine, Connecticut, West Virginia, New Hampshire, Florida, Colorado, or Louisiana; three times as many as the state of South Carolina; five times as many as Vermont; and ten times the number of Delaware. The 400 publications of Dakota include, 25 issued daily, 358 weekly, 12 monthly, 4 semi-monthly, and one quarterly. There are 392 papers printed in English, 4 in the Scandinavian languages, 3 in German, and 1 in Dutch or Hollandish. There are 382 newspapers of general information, 8 educational, 5 agricultural, 3 religious, and 1 medical journal. South Dakota has 275 papers, or more than South Carolina, Delaware, Vermont and Nevada combined—and as many as Minnesota. North Dakota has 125 papers, or more than Vermont and Delaware combined and more than Montana and Washington combined.

NICKEL is a product of the Black Hills.

NORMAL SCHOOLS are maintained by the territory at Madison and Spearfish, besides aid is granted to normal courses in ten private or sectarian institutions.

NURSERIES.—There are already several flourishing nurseries in South Dakota, and more are needed. Shade, fruit, and ornamental trees and shrubs are coming more into use as the country is settled and wealth accumulates.

NORTH DAKOTA.—The common geographical divisions of the north state are the Red river valley, the James river valley, the Devils Lake region, the Turtle mountain region, the Mouse river country, the Missouri slope or coteau region and the West Missouri country.

RED RIVER VALLEY.—This is a garden spot and has become famous the world over for its production of No. 1 hard wheat. It raises a great share of the wheat of North Dakota and contains about one-third of the total population and yet only one-fifth of the area has been subjected to human use. Much attention is being given to stock raising and marked success has been attained in the use of grain and root crops in fattening cattle and hogs. All the fodder or forage crops do well here as elsewhere in Dakota. There are many fine stock farms in this region. There is still a little government land left in the second tier of counties west of the river. The Red river is navigable 600 miles to Winnipeg.

THE DEVILS LAKE REGION presents many points of attraction to the settler. The lake is the largest in Dakota and well belted with timber. It is becoming noted as a health resort. The soil is fertile all about and all kinds of crops are raised. It is also a fine stock region.

TURTLE MOUNTAINS.—This is the most elevated part of North Dakota, the highest point, however, Butte St. Paul, being only 2,300 feet above sea level. There is considerable mineral wealth and timber here, with fertile soil in the valleys and surrounding country. A good many Canadians have located in this region and are making money in agricultural pursuits and stock raising.

THE MOUSE RIVER.—This stream comes down from the British territories and after a long sweep through North Dakota returns to the Canadian dominion. It is lined with timber and has fine agricultural and grazing lands everywhere tributary. Lignite coal of fine quality abounds along the banks. The country is coming into prominence for raising sheep, cattle and horses. Here and to the west is to be found the largest area of good free land in Dakota if not in America. It is penetrated by the St. Paul, Minneapolis & Manitoba railroad. The government land office is at Bismarck.

THE MISSOURI SLOPE.—This comprises the region west of the divide between the James and Missouri rivers. Along the divide are the Coteaux, or little hills, abounding in grass and noted for pasturage. The west part of the divide opens in the spring earlier than on the east side. All kinds of crops are grown.

WEST MISSOURI COUNTRY—This comprises a large region west of the Missouri, in which there are a number of prosperous colonies, engaged in general farming and stock raising. Good crops of hard varieties of corn are raised here. Coal abounds. There are a good many streams in this region, and much fine government land untaken. It is made accessible by the Northern Pacific railroad.

THE JAMES RIVER VALLEY.—After the Red river country this valley contains the most populous and prosperous counties of North Dakota. The land everywhere is rich and all kinds of crops grow. Stock raising has become a large and successful industry. There are still free lands in the north part of the valley.

OATS.—This crop is one of the most certain in its yield, year after year. In weight they are the heaviest grown in the Union, and possess special qualities for manufacture into meal for human use. For stock they are unsurpassed.

ONIONS are a prolific and sure crop, yielding from 200 to 500 bushels to the acre.

OUT WEST.—Eastern people who think that Dakota is near the western "jumping off place" are informed that it is in the heart of the continent, and has telegraphic and railroad facilities in every part of it. Chicago papers are distributed throughout the territory the day after publication.

OZONE, one of the vital elements of the air, is found in large per cent in the Dakota atmosphere. It is the active principle of oxygen, and its absence or weakness always occurs in times of epidemics in the large cities.

PETROLEUM.—Rock oil is one of the products of the Black Hills, and it is also found in the Turtle Mountains.

PENITENTIARIES.—There are two of them, one at Sioux Falls and the other at Bismarck, and one would be large enough to hold all of the prisoners, Dakota having fewer criminals in proportion to population than any other state or territory, the ratio being 1 in every 2,253.

PHARMACY.—The druggists of the territory have an organization having for its object the regulation of the sale of medicines and liquors.

POULTRY offers a fine opening, there is always a demand for chickens and turkeys, and this climate seems specially adapted to their culture. Last winter the families who gave their chickens a little attention were rewarded with a constant supply of fresh eggs.

POSTOFFICES.—Dakota has over 1,000 postoffices, more than in all the other territories combined, and more than in any one of 24 states. The revenue from the postal service—$500,000—in the territory is greater than from any state south of the Ohio river. There are 50 presidential offices, more than in any one of twenty states. North Dakota's offices number 443; South Dakota's 607.

POTATOES.—Growing potatoes will become a profitable business in Dakota. Everything is adapted to this crop, which has made the fortunes of many eastern farmers who spend half they make for fertilizers, and then do not raise more bushels to the acre than is produced with good cultivation on our prairie farms.

PRAIRIES.—The long, level horizon might remind us of descriptions of the Sahara, but beneath, instead of sand, is one of the gardens of the earth, the destined seat of a great civilization. And stored in deep vaults is water which comes rushing to the surface at the bidding of man. By conditions not possible before, scientific agriculture is touching the virgin soil and it bursts forth into marvelous plenty.

PRECIOUS STONES.—There are no less than ninety kinds of stones used for ornamental purposes found in the United States, of which the Black Hills and other parts of Dakota has a full share, and include agates, jet, jasper, garnets, obsidian, or volcanic glass, crystals, etc. Minute diamonds have been found in the itacolumite, or flexible sand stone, used by Mr. Edison in electrical experiments and taken from the Black Hills.

PRICES OF MERCHANDISE.—The average prices of most articles are not higher and some not so high as in the East. There is close railroad and business competition.

PUMPKINS, which in the hot climates run too much to vine, grow to good size and flavor.

QUARTZITE.—Along the Big Sioux river there is the largest outcropping of quartzite or jasper granite in America. It is of reddish color and susceptible of a glass like polish, and is so hard that sharp points will cut glass like a diamond. Quarrying this stone and preparing it for paving, building and ornamental purposes has become a large industry at Sioux Falls, Dell Rapids and at other places.

RAIN FALL.—The average total rainfall in Dakota, for five months, April to September—the growing season—as recorded for sixteen years, from and including 1872, was fifteen inches.

RAILROADS. — Thirteen states only have more mileage than Dakota. The mileage of the territory is as follows:

Black Hills and Fort Pierre railway	15
Burlington, Cedar Rapids and Northern railway	83
Chicago, Milwaukee and St. Paul railway	1,215
Chicago and Northwestern railway	758
Chicago, St. Paul, Minneapolis and Omaha railway	87
Fremont, Elkhorn and Missouri Valley railway	123
Minneapolis, St. Paul and Sault Ste. Marie railway	99
St. Paul, Minneapolis and Manitoba railway	1,191
Northern Pacific railway	837
Minneapolis and St. Louis railway	40
Illinois Central railway	15
Total miles of railroad in 1888	4,463

In addition some 250 miles of track has been graded ready for the iron.

RED RIVER VALLEY.—(See North Dakota.)

RELIGIOUS TOLERANCE.—As the race moves westward not only do eastern and Old World traditions, habits, and prejudices lose force, but speculative dogmas which divide Christians from each other, and which are the offspring of theological schools, sink with other unpractical ideas, and practical morality prevails, but without loss of religious sentiment, there being more harmony between the sects, in the belief that in union there is strength and victory over evil. Thus it is that Union services and Union Sunday schools are common.

RIVERS.—The principal river is the Missouri, with a navigable length of quite 1,000 miles within the limits of the territory. The next river is the James, the longest unnavigable stream--500 miles—entirely inside of one commonwealth. Among the other rivers are the Red, Big Sioux, Cheyenne, White, Moreau, Grand, Bad, Heart, Sheyenne, Pipestone, Cannon Ball, Knife, Mouse, Little Missouri, Pembina, Maple, Vermillion and Park, many small streams and creeks flow into the larger rivers, all combining with the lakes, in furnishing a large amount of widely distributed water surface.

REFORM SCHOOL, PLANKINTON.

RHUBARB or Pie Plant, flourishes without cultivation.

SOUTH DAKOTA.—The natural divisions of the South State are the Missouri Valley, the Sioux Valley, the James River Valley, Central Dakota, (using the term in a limited sense) the Sioux reservation, or Western Dakota, and the Black Hills.

THE MISSOURI VALLEY.—This section has already become noted for corn and swine, equal in every respect to the products of Iowa and Illinois, and it resembles those states in the extent and character of farm improvements and stock. There has been considerable attention too given to the cultivation of timber groves and orchards, and the face of the country has been greatly beautified. There is little or no government land, but improved and deeded lands are in the market.

THE SIOUX VALLEY.—This section of the east is well developed, the whole region being famous for its charming landscape, fertile soil, generous crops and extensive herds. It is well watered too, and possesses the finest granite quarries in America. There is no government land left, but improved and wild lands are cheap considering the fine general development.

THE JAMES RIVER VALLEY.—This valley reaches through both Dakotas, the part in South Dakota enjoying the distinction of producing No. 1 hard wheat quite equal to that of the North. Locally it is known as the "Jim" river, and along its banks are some of the most thrifty towns and farms to be found in America. It is also becoming a fine stock region as is attested by many fine herds of thoroughbreds and graded stock to be found in every county. There is no free land here, but cheap deeded lands are for sale.

Central Dakota is a term applied to the divide or prairies between the James and Missouri rivers into which settlement is pushing. Results prove its capabilities for grain and stock growing. There is vacant land in this section.

Western Dakota includes the Sioux reservation, 1,000,000 acres of which will soon be opened to white settlement. It is destined to be a fine agricultural and stock country.

Black Hills.—Nature seemed to have given this region a little of everything in the way of resources, no equal area in the world showing a greater variety of minerals, a richer soil, more fine scenery or better climate. They contain the largest known gold mines, and the only tin mines worked in America. Dr. Hayden says they form one of the most interesting geological studies on the continent, owing to the regularity of the upheaval. All the formations in the West are revealed in the belts around the granite nucleus in their fullest development.

Salt.—Not only salt wells, but deposits of rock salt have been found in the Black Hills, as well as in other parts of the territory.

Salad Plants.—Cabbage, lettuce, celery, endive, spinach, etc.—plants whose leaves only are eaten—are more tender here than in the warmer climates because their growth is slower and there is better chance for the digestion and distribution of their juices than in the hot southern sun where growth is forced.

Sanitariums.—To the invalid in search of health and the tourist in pursuit of pleasure, the hot springs of southwestern Dakota and Devil's lake in North Dakota offer great advantages, and both are destined to become notable resorts.

School of Mines.—This institution, located at Rapid City, has for its object the training of students in mining, mechanical and scientific subjects. It has a mission too in studying the wonderful geological formation of the Black Hills.

School Lands.—The law reserves two sections—1.280 acres—in every township for school purposes. This will form the nucleus of enormous permanent funds for the two Dakotas. The act of admission prohibits the sale of school lands under $10 an acre.

Scenery. —Other states and territories may boast of more sublime scenery, but Dakota has much to produce sensations of awe and delight. The Black Hills, the Turtle mountains, the Bad Lands, the Missouri river, the coteaux, the vast level expanse and the unspeakable purity of the air all combine to give variety and pleasure. Days of bright sunlight are followed by nights of starlight as brilliant as those which on Chaldean plains gave birth to astronomy.

Seasons.—The changing seasons in our Dakotan climate, even if the beauties of home are humble, are still infinite. We can secure to ourselves endless variety without leaving our own firesides, and say, with Ruskin:

> "How different is the view from our windows as we look on the tender green of spring, the rich foliage of summer, the glorious tints of autumn, or the delicate tracery of winter. We may make our daily travels interesting, even though like the Vicar of Wakefield's family, all our adventures are by our own fireside, and all our migrations from one room to another."

The spring clothes the face of nature with grass and flowers, the summer and fall "rounding" them up in fullness and perfection, so gratifying to every sense, while the winter, so much dreaded by those who know nothing about it, needs the pen of a Ruskin to portray the atmospheric phenomenon, the grandeur of the morning and evening skies, the brilliancy of the auroras, the nights gemmed with stars, and an air so stimulating and bracing, fits one for the fullest enjoyment of life.

Seeds.—Several Eastern dealers have seed farms in Dakota, raising hardy seeds for more southerly points.

Settlement of Lands.—During 1888 there were 12,207 entries, covering 1,881,229 acres, and 9,377 final proofs and cash entries completed, covering 1,452,760 acres, in all double the area of Rhode Island. The figures for the first half of 1889 justify the belief that the totals this year will be much larger.

Shack is a Western name for a cabin.

Sioux Reservation.—The area of this reservation is 33,739 square miles, or 21,593,129 acres, and includes about 42 per cent of the South state. Commissioners are treating with the Indians for about one-half of this area to be thrown open to white settlement. These lands will be subject to homestead entry only, requiring a residence of five years besides the payment of $1.25 an acre in yearly installments. Soldiers and sailors are allowed their time of service up to four years as in the general homestead law. (See South Dakota.)

Silver is found in various forms in the Black Hills and in quantities sufficient to place Dakota ninth as a silver producer among the other states.

Snowfall.—The signal service records the snowfall in Dakota during the winter of 1886-7 at 47.8 inches as against 61.5 in Michigan, 55.7 in New York and 86.0 in Maine. The winter of 1888-9 had a very light snowfall, and was so uniformly mild that farmers were able to work in the fields every month.

SOCIETIES.—All the leading religious, benevolent, secret, labor, temperance and educational organizations can be found in Dakota, of which the following are named:

- Masonic—Blue Lodge to Consistory.
- Independent Order of Odd Fellows.
- Knights of Pythias.
- Ancient Order of United Workmen.
- Young Men's Christian Association.
- Women's Christian Temperance Union.
- Independent Order of Good Templars.
- Grand Army of the Republic.
- Sons of Veterans.
- Woman's Relief Corps.
- Chautauqua Literary and Scientific Circles.
- White Cross League.
- American Legion of Honor.
- United Ancient Order of Druids.
- Father Mathew Temperance Society.
- Crusaders' Total Abstinence Society.
- Protective Order of Elks.
- Order of Woodmen.
- Farmers' Alliance.
- Royal Arcanum.
- Knights of Labor, etc.

SOCIAL LIFE.—It may be justly claimed that the people of Dakota are as peaceful and law-abiding and that the tone of moral sentiment is as high as in any part of the East. It is difficult to find a locality without its "meeting house" and school house.

SOIL.—The soil of Dakota varies in localities, but as a rule is composed of disintegrated rocks and enriched by vegetation of the centuries. Analysis shows the presence of lime, phosphorous, soda, potassa, magnesia, and other elements necessary to the growth of perfect grain, grasses and vegetables, all combining to make a soil of lasting fertility. The subsoil is of the drift formation, gravel and boulders, filled with living water.

SIOUX VALLEY.—(See South Dakota.)

SOLDIERS' HOME.—The territory is now building a home of refuge for aged and dependent soldiers at Hot Springs.

SQUASHES.—The climate seems suited to the growth of squashes of excellence for table use.

STOCK GROWING. — The splendid growth of native grasses, the invigorating air, the pure water, the comparative immunity from contagious diseases, the ease with which tame forage, grain and root crops can be produced, all combine to make Dakota the best beef growing country in the world. The horses raised here have more muscle, endurance and lung power than those of the East. The territory in many parts is admirably adapted to sheep and hogs, the country being exempt from foot-rot, scab, cholera and other scourges which make so formidable enemies to both in other states.

SUNDAY SCHOOLS.—The Sunday school interest is so large in the territory—1,500 schools—that two associations have been formed.

SWEET POTATOES have been raised with success in South Dakota.

TAXES in the counties range from 8 to 25 mills, the great bulk of which is for school purposes. The territorial levy is 3 mills.

TEMPERATURE.—Weather reports from thirty widely separated stations in Dakota extending over a period of fifteen years, show a mean annual temperature of 41.5 degrees, with January, the coldest month, averaging 8 degrees, and July, the warmest, 71.8. Comparison shows that no month in the year in Dakota will average as cold as in the New England states. The cloudy days in Dakota average 60 in the year as against 160 in New England.

TELEPHONES are in use in all of the principal towns of the territory.

TELEGRAPHIC FACILITIES are found in nearly every county.

TIMBER.—There is a lacking of trees in Dakota, but there is compensation in the fact that there are no stumps to clear away to get the land ready for the plow, and also that the farmer can plant trees and have his grove where he wants to. Twenty years ago much of Iowa and Southern Minnesota was as treeless as Dakota is to-day, but the success of timber culture in these states is attested by numerous and beautiful groves to be seen now in every direction. For every five acres of trees the law of Dakota exempts forty acres with $1,000 improvements from taxation for ten years.

TIN.—The only tin mines worked in America are those of the Black Hills, which yield richer ore than any found in England or Europe. When fully developed this will be an industry of vast importance.

TIMOTHY is a success in Dakota.

TOBACCO will grow in Dakota, as shown by fine samples at various county fairs.

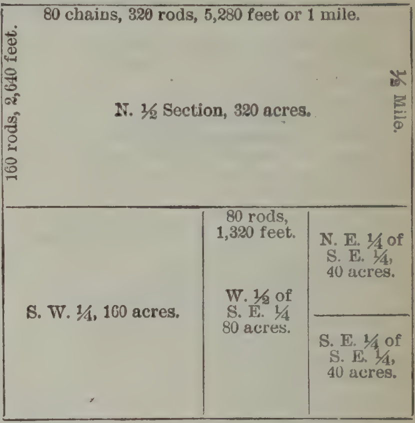
TOPOGRAPHY. — The general topography of Dakota is that of a great undulatory plain covering four-fifths of its surface. West of the Missouri the country is more broken, while east it is a vast prairie, abounding in lakes and streams, and traversed between the Missouri and the James, and the James and the Minnesota lines by a belt of little hills—the Coteaux of the French.

TOWN & SECTION DIVISIONS.—To those who live where lands are bounded by the meandering of streams and by lines running from one prominent object to another, as from rock to tree, etc., and one is bewildered in attempting to trace his boundaries, we wish to say that in Dakota and other western states and territories there is no such trouble. All of our land surveys are at right angles, in townships six miles square, each township containing 36 sections of 640 acres each, or in all 23,040 acres. The sections in each township are numbered, beginning at the right upper corner, from 1 to 36, as shown in the following plat:

TOWNSHIP AND SECTION.

N W N.E S.W. S. E	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

In the British territory north of us our land survey has been adopted, except that the numbering of the sections begins at the right lower corner. In Dakota and other western territories sections 16 and 36 are reserved for the benefit of schools and are not subject to entry. This will result in the making of an enormous school fund for the Dakotas. The following shows the subdivisions of a section:


80 chains, 320 rods, 5,280 feet or 1 mile.
160 rods, 2,640 feet.
N. ½ Section, 320 acres.
½ Mile.
80 rods, 1,320 feet.
N. E. ¼ of S. E. ¼, 40 acres.
S. W. ¼, 160 acres.
W. ½ of S. E. ¼ 80 acres.
S. E. ¼ of S. E. ¼, 40 acres.

Townships are numbered as they are either north or south of a base line, and east or west of a principal meridian. The surveys in Dakota are, except in the Black Hills, numbered in townships from 89 on the Nebraska line to 164 on the northern boundary, all north of a base line in the Washita mountains, six miles south of Little Rock, Ark., and in ranges from 47 on the Minnesota line to 107 on the Montana line, west of the fifth principal meridian, which runs through the western part of Wisconsin and Illinois. To describe and locate on a 160 acre farm somewhere in the central part of North Dakota would be as follows: "The southwest one-quarter of section 6, township 138 north, and range 73 west of the fifth principal meridian." More than one-third of the area of Dakota is yet unsurveyed.

TOWNS.—Eastern people always evince surprise at the enterprise exhibited in the public improvements enjoyed by nearly every Dakota town and city. Electric lights, telephones, water works, street railways, artesian wells, daily papers, graded streets, sidewalks, opera houses, etc., to a degree not seen in the older places of many times the population in the East. The average Dakotan thinks there is nothing too good for him. Everywhere, too, will be found a love for music, books, and those social amities which make life worth living.

TERRITORIAL DIVISIONS.—The joint committee of the two constitutional conventions made the following division of the property, debts and records of the territory: North Dakota assumed the payment of the following bonds: $226,000 on account of the Jamestown hospital for the insane; $96,700 for the Grand Forks university; $93,600 for the Bismarck penitentiary; $83,507.46 capital building warrants. South Dakota assumed the following bonds: $210,000 on account of Yankton hospital for the insane; $51,000 for the Sioux Falls deaf mute school; $75,000 for the Vermillion university; $94,300 for the Sioux Falls penitentiary; $97,500 for the Brookings agricultural college; $49,400 for the Madison normal school; $33,000 for the Rapid City school of mines; $30,000 for the Plankinton reform school; $25,000 for the Spearfish normal school; $45,000 for the Hot Springs soldiers' home. South Dakota pays $46,500 on account of excess of appropriations for institutions, also $4,000 for the territorial library. The records in the offices of the governor and secretary are retained by North Dakota, the records in the other offices going to South Dakota. All property that could be was equally divided and provision was made for making copies of certain books and records.

The south state starts with ten institutions, as against three in the north state, but the constitution of the latter makes liberal provisions for all that may be needed in that direction. It takes the matter out of the hands of the legislature and thus prevents loclaity contests. It locates the capitol at Bismark, the state university (already established) and school of mines at Grand Forks, the agricultural college at Fargo, a normal school at Valley City, appropriating 50,000 acres of land therefor; the deaf and dumb asylum at Devils Lake, the reform school at Mandan, a normal school at Mayville, appropriating 30,000 acres of land therefor; a hospital for the insane, with an institution for the feeble minded in connection therewith, at Jamestown, appropriating 20,000 acres of land therefor. The insane hospital is already established, and has become famed over the whole country for its completeness and perfect management. It also permanently locates the following institutions: A soldiers' home at Lisbon, with a grant of 40,000 acres of land; a blind asylum at such place in the county of Pembina as the electors may determine at an election, with a grant of 30,000 acres; an industrial school for manual training at Ellendale, with a grant of 40,000 acres; a school of forestry at such place in one of the counties of McHenry, Ward, Bottineau or Rolette, as the electors of said counties may determine by an election for that purpose; a scientific school at Wahpeton with a grant of 40,000 acres; provided that no other institution of a character similar to any one of those located shall be established or maintained without a revision of the constitution.

TREES TO PLANT.—The Territorial Horticultural society, after thorough examination and from reports made by tree planters, gives the following list of trees as suitable for the purposes designated:

FOR FORESTS.

Box-elder, white or green ash, rock elm, larch, white birch, soft maple, butternut, cottonwood, black cherry.

FOR WIND-BREAKS.

White willow, cottonwood, box-elder.

FOR STREET TREES.

Hard maples, white elm, basswood, hackberry, ash.

ORNAMENTAL TREES.

Bird cherry, larch, white birch.

FOREST EVERGREENS.

Red cedar, white pine, European larch, American arbor vitæ.

ORNAMENTAL EVERGREENS.

Colorado blue or white Northern spruces, Siberian fir, Scotch pine, dwarf mountain pine, red cedar, any variety of arbor vitæ.

TURTLE MOUNTAINS.—(See North Dakota.)

UNITED STATES ARMY.—The territory is included with Minnesota and Montana in the Department of Dakota. The territory contains nine forts or military posts, to-wit: Fort Abraham Lincoln, with a force of 89 men and 6 officers; Fort Bennett, 41 men and 3 officers; Fort Buford, 302 men and

22 officers; Fort Meade, 165 men and 15 officers; Fort Pembina, 69 men and 7 officers; Fort Randall, 172 men and 16 officers; Fort Sully, 176 men and 14 officers; Fort Totten, 88 men and 9 officers; Fort Yates, 160 men and 18 officers. Not including the pay roll, the expense of maintaining the department during 1888 was nearly $1,000,000—enough to put down a good many artesian wells.

VALUATION.—The total assessed value of all property in Dakota, according to the assessment roll of 1888, was $161,420,974.30, with nearly 4,500 miles of railroads, valued at $40,000,000 and untaxed except on gross earnings, and property listed at about half the true worth. It is safe to place the actual wealth of the territory at $350,000,000. The number of acres of land assessed is 32,832,816, at $91,875,729, out of a grand total of over 96,000,000 acres—some wild land yet to be subdued and brought to human use. See counties for local valuation and live stock for number and value.

VANADIUM is one of the products of the Black Hills. It is a white metal and resembles silver, but is brittle.

VEGETABLES.—All the field and garden vegetables are raised without more than the usual effort and as a rule of a large size and good flavor.

VOTE.—In the election for delegate in 1888, Matthews, Republican, received 25,310 votes, Harden, Democrat, 15,801, in North Dakota; in South Dakota, 44,905 and 25,045 respectively; Matthews' total vote being 70,215, to 40,846 for Harden. Brierly, Independent Democrat, received 1,753 and Crossman, Prohibition, received 1,316 for the same office. The total vote was 114,130.

WATER WORKS. — There are twenty-six water plants in Dakota cities, more than in all the other territories combined, and more than in any one of nineteen states.

WATER SURFACE.—Including lakes and rivers, Dakota is estimated to have nearly 1,500 square miles of water surface.

WATERMELONS are a staple garden product of South Dakota.

WAGON ROADS.—No section of the country can boast better dirt roads the year round than Dakota.

WOOL from Dakota sheep brings a better price than any from the other territories.

WAYWARD AND VICIOUS CHILDREN are cared for in a reform school at Plankinton, but there are few inmates.

WELLS are had at easy depth in almost every part of the territory, furnishing good water.

WINDS.—All windy countries are healthy ones. The winds of Dakota are not severe, but constitute a lively agitation of the air conducing to its clearness and purity and imparting qualities which give tone to the system and vigor to all animal life.

WHEAT is the leading product of Dakota. It is of the spring variety. In 1887 and 1888 the territory took first place in the number of bushels produced. The wheat is of the hard variety, due to the long, warm sunny days which causes the grain to ripen better. It is best for the roller process of grinding, and a given quantity of flour made from this wheat will make more and better bread than from any other kind. Dakota wheat took first premium at the New Orleans exposition.

YOUNG PEOPLE.—Dakota is eminently a land of young people. A majority of the settlers are young men and women, full of hope, life and activity, and inspired by a glorious climate, have builded one of the grandest commonwealths of the new West. Most of them started without money, but they were liberally supplied with industry and intelligence.

Go where you will, in town or country, you will find young men in command. In the stores, offices, and everywhere, in the growing young cities, and on the farms and public lands, it is the same—young men on guard. The meaning of it all is that the best part of the life, energy and enterprise of the older states has been drawn on freely to fill the arteries and strengthen the sinews of these two young giant Dakotas. It means that the young man of push and brains does not intend to stay in the over-crowded cities and slow moving communities of the East, but makes his way steadily to the front, in the West, where he is not compelled to compete with the accumulated capital of years and old-established institutions, but where energetic effort and enthusiasm furnish the start on small means which is out of reach of the youth of the East.

While Dakota has done a great deal for young men, it has also bettered the condition of a great many young women and offers the enterprising members of that sex a world of opportunities. The young women of Dakota are worthy to take their places by the side of her young men. They are found as teachers and housekeepers, as clerks and servants. They were and are found among the homesteaders and pre-emptors on the public domain. Many interesting sketches could be drawn to true life by way of illustrating the average actual experience of the young woman claimant, who braved unflinchingly what to her were very often real hardships, in order to acquire a home of 160 acres of land. The number of women in Dakota who have obtained a quarter section of land by completing the required term of residence, or by "proving up" after six months' residence and paying for the land, is very large. It was stated, in 1886, by a member of the legislature from Faulk county, that in his county the women who had acquired government land or were then "holding down" claims, numbered over 5 per cent of the total population. This property interest, if taken good care of, will prove a snug sum by the way of deposit against a rainy day, or a wedding day, or some other day when the independent young woman can use a little ready capital to advantage. There are many reasons certainly why the self supporting girl who wants to make her own way in life or until she marries, should like Dakota.

ZINC is one of the products of the Black Hills.

ZEAL is one of the characteristics of the Dakotan in all enterprises.

ZOOLOGY.—The large wild animal life of Dakota is rapidly disappearing; the buffalo has gone, and the elk, moose and deer are rapidly going. Of small, four-footed game and birds there are still many existing varieties. The reptile family is small, the rattlesnakes being the only harmful members and fortunately very rarely seen.

FREE HOMES IN DAKOTA

HOW TO OBTAIN PUBLIC LANDS IN THE NEW STATES.

Comprehensive Explanation of the General Rights of Every Citizen Regarding Homesteads, Pre-Emptions and Tree-Claims—Location of Vacant Lands.

For the convenience of settlers and purchasers the public land of the United States is divided into districts. The land is surveyed on the rectangular system, which is simplicity itself. It begins with the establishment of a meridian and base line. From the base line are run townships of six miles square, and numbered north and south and called ranges, as they are numbered east and west from the meridian and called townships. The base line of Dakota surveys, except in the Black Hills, runs six miles south of Little Rock, Ark., while the meridian is the fifth, which runs through the western part of Illinois and Wisconsin. Each township is divided into thirty-six squares or sections of 640 acres each, which in turn is subdivided into four of 160 acres each, and again into forties. At each corner of the section is a mound and stone or post with the number of township, range and section clearly marked on it. Half way between these corners is a smaller mound and post designating the quarter sections. Sections 16 and 36 in each township are reserved for school purposes, which in total gives Dakota the basis for an enormous permanent school fund.

After surveys are completed plats of the various townships are made at the general land office in Washington, and sent to the land office of the particular district in which the land may be. There are two officers in the local land office, a register, who records the filings made by settlers and keeps run of the disposition of lands, and a receiver, who takes charge of the moneys paid for public lands and is the authority to whom proof of settlement must be made to secure the deed or patent from the government in the closing act known as "proving up." He is also judge in contests made for non-compliance with the land laws. In securing agricultural lands there are three methods: By taking a homestead, pre-emption, or tree-claim, 160 acres being the maximum amount that can be "filed" on in each case. A homestead and tree-claim, or a pre-emption and tree-claim can be taken at the same time, but a pre-emption cannot be taken up before the homestead is "proved up," or vice versa. The pre-emption and homestead require residence on the land to secure title. In tree-claims of 160 acres each, eight years are given in which to raise ten acres of trees, the law requiring proof that 675 thrifty trees are growing on each acre, or 6,750 in all. Thus it is seen that the settler can secure 480 acres of public land.

Having thus shown the general rights of every citizen, we will now explain how to practically apply and enjoy the privilege. The intending settler can reach any of the ten land offices in Dakota (See Land Offices) by rail. Apply at once to the register and get a plat of townships in which there is still vacant land. This official will give the applicant all the information he possesses concerning the character of the land and how to reach it. With the plat he proceeds to the locality it designates, and by aid of the figures on the section posts or stones, makes his selection. Settlers already on the ground, and anxious to have neighbors, are always glad to assist in locating the home seeker. In every town adjacent to vacant lands are agents who for a small fee will aid persons in locating lands. After selection is made, the land office is again visited, where the register will supply the blanks on which the applicant will fill out a description of the township, range, section and quarter where his selection may be, and make affidavit of his intention to settle on the same. These are filed with the register and a fee of $14 paid, if a homestead is taken, after which, at the expiration of five years, the government will give a deed or patent with no additional cost except $4 when final proof is made. If the settler does not want to wait five years for deed, he can within one year of settlement change to pre-emption and pay $1.25 an acre if outside of a railroad grant, ,or $2.50 if within. The only land coming within the $2.50 provision is in North Dakota along the Northern Pacific. The pre-emptor can pay in cash or by military bounty land warrants, agricultural college, private claims or supreme court script. Soldiers can deduct the term of their service in the army from the time necessary to secure a homestead, but must make entry at land office in person and pay a declaratory fee of $2. In making entry for tree claim $14 must be paid, and a like sum at the end of eight years on final proof.

Relinquishments of public lands may often be obtained at very low figures. Information about this class of lands must be sought from private parties, either the claimants themselves or their agents. There are cases where through improvidence or neglect the claimant has failed to comply fully with the provisions of law, and is willing to sell out cheap rather than stand the risk of a contest. But these are opportunities a person must hunt up for himself.

CHEAP DEEDED LANDS.

Many farmers, of the well-to-do class, will prefer to invest in deeded property situated in the older and more settled portions of each Dakota, rather than go to the front and take up government claims. Cheap deeded lands, with or without improvements, can be obtained in every section of the territory. The price of land in Dakota is low because of the competition of the public domain. The desirable government lands are rapidly going, however, and the price of land will show a corresponding increase. As the result of existing conditions, fine farming lands worth $50 to $60 an acre can be bought for $20 an acre. Land that sells at $10 an acre is well worth $20 to $25 an acre. Unimproved land can often be obtained as cheap as $5 and $6 an acre, which is putting a Dakota farm within nearly everybody's reach, aside from the free land area, where all may have one for the filing and bona fide settlement of the same, and yet which does not possess the same attractions for all. Among the leading advantages which Dakota has to offer at this time, her cheap deeded lands should not be lost sight of or overlooked.

RAILROAD LANDS.

Grants of land were made by the government in aid of the construction of the Pacific and other western railroads at a time when public policy demanded the encouragement of such enterprises, which have since proved to be of many times the value which furnished the consideration of the land grant. Parts of two grants to railroads were located in Dakota. One of these embraced only about 500,000 acres, granted to the Winona & St. Peter railroad, now owned by the Chicago & Northwestern. These lands were situated in Eastern Dakota, on either side of the railroad built at the time only as far as Watertown. There is nothing very desirable left of this grant. Concerning any tracts not yet sold, which might be utilized for farming or grazing, the land commissioner of the Chicago & Northwestern railway, Chicago, will furnish information.

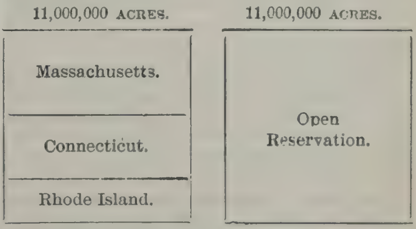
The other grant was of 10,000,000 acres, to the Northern Pacific railroad in North Dakota. The railroad company have still for sale 6,000,000 acres of land on easy terms to settlers. The Northern Pacific lands are among the most desirable to be had, price, soil and location considered, and with the increasing tide of immigration flowing northward and westward from St. Paul, will be disposed of only less rapidly than the public domain. The prices of these lands range chiefly from $3 to $6 an acre for agricultural lands, and $1.25 to $4 an acre for grazing lands. Terms of sale allow five and ten years' time at 7 per cent., one-sixth or one-tenth of the amount of purchase being required in advance. Further information about these lands will be furnished cheerfully by the general emigration agent of the Northern Pacific railroad, St. Paul, Minn., to whom all inquiries are referred.

LOCATION OF LANDS.

The bulk of the present vacant land area—21,000,000 acres—lies in the Bismarck and Devils Lake districts, North Dakota. Until the Sioux reservation lands come into market, which will not be long, the most of the vacant lands in South Dakota will be found in the Rapid City (Black Hills) district. There it some good land left in the Aberdeen district, South Dakota, and in the Grand Forks district, North Dakota; a little still to be had in the Fargo district, North Dakota, and the Huron district, South Dakota; a little less yet vacant in the Watertown district, South Dakota, and none to speak of in the Mitchell and Yankton districts, South Dakota.

THE SIOUX RESERVATION.

The Indians have agreed to give up 11,000,000 acres, or half of their reservation, to white settlement. Few persons realize the extent of this great transfer of land, equal in area to three New England states.



This will furnish 160 farms each to 72,000 families. Several railroads will be extended at once through to the Black Hills, and bring that rich section in direct and close connection with the East. The resources of the reservation are as varied as any in the West. It is watered by numerous streams. The Big Cheyenne, which contributes the largest volume of water to the Missouri, is the northern boundary of the part opened to settlement, the White river forming the southern boundary. Throughout its borders are some of the finest agricultural and grazing lands in the West, and the region is destined to support a large population. The land is unsurveyed and until it is persons taking up claims must do so under squatter's rights.

WHO SHOULD COME.

Persons of no means but willing to work.

Persons of small means and lots of energy.

Persons who want to get the best and cheapest land in the Union.

Persons who want to live in the healthiest country in America.

Persons of considerable or large means who are not prospering in the slow-plodding East.

Persons who want land that will produce as much to the acre as any in the North Temperate zone.

Persons who want to escape consumption—the most fatal disease in the Union—catarrh, and other throat and lung diseases.

Persons who have no home of their own in the East, but have courage and are willing to make self denials until they get a start.

Persons who are young and can't make a start before old age where they are, had better come and grow up with the country. Growing up with the country means wealth on your part.

Persons who want to find a country where horses and cattle are not troubled with fevers, hogs with cholera, sheep with foot-rot and scab—where all kinds of animals enjoy singular immunity from disease.

Persons who make a scanty living on rented farms back East should come and get a free farm of their own, and by saving rent become independent with half the labor expended in making money for landlords.

Persons who have much invested in small but high-priced farms, farms in the East, but not large enough to provide for a growing family, can sell, and with the proceeds establish themselves in first-class style on the virgin prairies of Dakota.

VOICES FROM DAKOTA.

Believing that a little testimony from actual and intelligent residents and correspondents would add to the value of this publication, the following, selected from a mass sufficient to make a large volume, is herewith submitted, in hope that the reader will peruse every line:

SPLENDID REPORT FROM A LADY.

Laura A. Aldeman, of Hurley, Turner county, South Dakota, writes as follows to E. P. Wilson, G. P. A., of the Chicago & Northwestern railroad:

"An effective way to dispell the illusions that have crept into the average Eastern mind in reference to Dakota and its alleged disadvantages of climate, etc., is to live in Dakota until all homesickness is eliminated, and then return to one's native state, if in the East. One contrasts the raw, depressing rain and sleet of their winters, with their accompanying mud, and prefers our moderate snow fall and fine roads, our surprisingly small per cent. of storms as compared to theirs, and our surprisingly large per cent. of sunshine as compared to their cloudy skies; our superb autumns, which are one long poem of sunshine, while with them November weather is a synonym for discomfort. At this writing, in early December, the belated farmer is finishing his plowing. But, except in rare cases, the Dakota farmer has finished all needed plowing to the last furrow; his crops are all gathered, and he is, par excellence, a gentleman of leisure, and still the days are full of sunshine, with just enough winter in the air to be bracing.

Another bugbear has been, "You cannot raise fruit there." That cry has followed the advance guard of civilization from the Atlantic to the Rockies, and, having been deluged with the rubbish of Eastern and Southern nurseries, we have found that we cannot raise figs from thistles. But Dakota has learned from her failures as well as her successes, and one need no longer pioneer here in fruit raising. In a rambling trip through Iowa, Illinois, Michigan and Northern Iowa during the last winter and spring I did not find an orchard, young or old, that showed a less per cent. of trees injured by climatic influences than does the Aldeman fruit farm, located near Hurley, and having no wish to pose as a romancer, and without fear of successful contradiction, I assert that the fruit belt of the Northern Middle states does not contain an orchard showing a less per cent. of dead and injured wood than do 100 acres of the 130 of this orchard. The history of this orchard is an epitome of the story of fruit raising in South Dakota, and a prophecy of the success that awaits us. The first planting was an experiment, absolutely, and almost as absolutely a failure, and having no precedent to follow: the next was better, but success indifferent. But having discarded varieties not adapted, the planting on this farm during the last eight years shows but a small fraction of one per cent. of failure, and tiny trees less in height than a man's stature have been laden with fruit.

The question as to success in small fruits is no longer raised. Probably twenty bushels of strawberries per day were shipped by one grower alone from this point during the season, as were currants, raspberries, gooseberries, etc., in their season. To deprive one's family through long years of these luxuries on a Dakota farm, is simply a crime.

The success of Mr. Terwillager, of this county, as a vineyardist, is phenomenal, he having fruited more than thirty varieties of grapes, many with signal success.

To be brief, while the state of South Dakota in embryo already ranks high as a wealth-producing land, with its record of 24,000,000 bushels of corn in 1887, proven by government analysis as leading all the states in the per cent. of food-producing properties contained in this, its leading cereal, with all that that implies in the swine, cattle, and horse-raising industries, in connection with its natural meadows, justly far-famed, let not the fact be overlooked that the question of her taking high rank for her horticultural products is only a question of intelligent enterprise.

WHAT DIVERSIFIED FARMING DOES.

John Birkholz of Grand Forks, North Dakota, writes to J. Bookwalter, land commissioner of the St. Paul, Minneapolis & Manitoba railroad, under date of March 20, 1889:

"In the five years of farming, my wheat has averaged 20 bushels to the acre; oats 50 bushels and barley 40 bushels. No matter what the season may be—wet or dry—in this section, farmers are sure of an average crop. In 1886 there were but two light showers from seed time to harvest. In 1888 the season was very backward with considerable cold weather and very heavy rains which in many sections would have ruined the crops, yet in both of these years my wheat averaged 15 bushels to the acre. In 1887 a considerable portion of my land yielded 35 bushels of wheat to the acre. The land is level prairie, free from stone or gravel, rich, black loam 2 to 3 feet deep, with clay subsoil. On one 160 acres of this farm there have been raised eleven crops in succession without fertilizing or summer-fallowing, and it yields as abundantly to-day as it did 5 years ago. Seeding for wheat begins from April 1st to 10th and harvesting last of July to first of August. For barley, seeding is done from May 20th to June 1st on spring plowing, and is ripe for the harvest about August 1st. It yields best on old land and improves it—acting as a fertilizer.

"For stock this section is unsurpassed. All kinds do well. Horses, cattle and sheep fatten on wild hay, which is nutritious and yields abundantly—an average of two tons per acre. Hogs fatten on ground barley equally as good here as they do on corn in Illinois or Missouri. I have on my farm 100 fine grade sheep with two thoroughbred Shropshire bucks. These have produced this winter 79 fine, strong lambs, ranging from one week to two months old at the present time, March 20. Most of them were born in January. I consider them the most profitable stock on my farm, the wool yielding a profit over the expense of keeping them. The cold weather agrees with the stock, the air being dry, pure and bracing. On this farm are about 100 head of horned stock and a registered polled Angus bull; also 60 head of horses and an imported Percheron stallion. The stock is turned out every day during the winter, except when it is storming, and then housed at night. Diversified farming pays. Cattle and hogs can be fattened as cheaply here, if not cheaper, than at any other point on the globe. Potatoes yield from 200 to 400 bushels to the acre. Turnips and mangolds yield from 1,000 to 1,500 bushels to the acre. Farming has paid me 25 per cent. on the money invested. I have never lost a head of stock from disease of any kind. Our farmers are all well to do and prosperous in this section. Most of them came here eight to ten years ago with little or nothing."

PROSPERITY IN FARMING.

P. B. Groat, general immigration agent of the Northern Pacific railroad:

"Farming has its ups and downs, but it is notably the case that there are a far less number of failures among agriculturists than occur among those engaged in any of the commercial pursuits. To insure success in farming all that is necessary is for farmers to husband their incomes in seasons when high prices and good crops come together. It is the experience in North Dakota that the farmers who are economical and exercise prudence in saving their incomes during periods when high prices are realized for grain are uniformly prosperous. A good farm can always be relied upon to furnish a comfortable living and some profit even in the off years, especially if mixed farming, in connection with farm stock raising is followed. In addition to the farming possibilities and the accompanying dairy industries, there are excellent openings in the numerous trade centers in both Dakotas for profitable business in all mercantile pursuits, in the various trades and in all of the professional callings. With vast agricultural resources to supply the means for large annual earnings from the products of a most fertile soil, the two new states must in time take rank among the richest states in the American Union."

CHANCES FOR THE INDUSTRIOUS POOR.

Correspondence of The New York Tribune: "In a journey of about 1,500 miles through the territory I have found only ten men who came here, until within the last three years, when manufactories began to be established, possessed of more than $7,500, and nine-tenths of the present population brought with them less than $500.

"The farmers, especially, who settled down under the homestead laws were deplorably poor when they took up their claims. Thousands of them are now, ten years later, lending money.

"A farmer living a few miles from Aberdeen, who established himself on his homestead in 1879 with a cash capital of $70, produced 1,500 bushels of wheat the next season. His second crop was 2,000 bushels, and in 1887 he gathered in 5,500 bushels. He owns 1,280 acres to-day, bought and paid for. He owns sixteen horses, thirty cattle, twenty-four sheep, and he has a modest fortune of $15,000 earning him 10 per cent. interest. This is an unusual record, or, more accurately speaking, it is the record of an unusually prudent and thrifty man. He did not start out in a gabled mansion, but in a sod shack. He began with a yoke of oxen and waited for his trotting horses until recently."

THE OPINION OF A STATESMAN.

From a speech by Hon. S. S. Cox: "Dakota in length and breadth, in population, in area, in wealth and in progress stands unexampled in the annals of mankind for material, political, and I may say, intellectual and spiritual, advancement. Her surface is nearly all arable land. It is easily tilled and miraculously productive. There is no necessity to clear trees and remove stumps. The old fort, Sitting Bull, and all the wilderness of early days, has given way to cities and towns, and railroads, and farms, and a population larger than that of many states, looms up in majestic proportions with all the paraphernalia of government, and all the refinement of Christian civilization. This energetic and hopeful people have in their veins the vigorous blood of many races. They have inherited the material, intellectual and moral triumph of the old and new worlds and their civilizations. They have settled upon soil which has no rival in richness and no peer in production."

A HEALTHY COUNTRY.

Correspondence of The St. Louis Globe Democrat: "This is a healthy conntry. The people look it as well as talk it. The patent medicine man has evidently discovered that the Dakotas are a discouraging field for him. He has learned this lesson before he wasted much of his artistic talent on the fences and barns of the new country. You will ride for days over the prairies of Dakota and never see an advertisement of a liver pill, a cough syrup or a kidney cure. The drug store is not the profitable business here that it is where malaria abounds. How about the doctors? Well, it must be admitted that they are in about the same small proportion to the population that deaths are. The young man who comes to Dakota with a diploma and an assortment of pills soon discovers that the practice of medicine must be supplemented with something else to make both ends meet. He goes into the land business or politics, and his profession becomes a side issue. There is not a medical school in the Dakotas, and yet there are nearly twenty higher institutions in which theology, law, mineralogy and everything but the healing art are taught."

NOT AS COLD AS NEW ENGLAND.

Correspondence of TheCanadian-American, of Chicago: "The climate of Dakota is much milder than that of Canada, and tables of annual temperature show the New England states to be colder by several degrees than this territory, which is often alluded to as the 'home of the blizzard.' So long as other states are scourged with cyclones and sweltering heat, with earthquakes and floods, with forest fires and drouths, with afflictions of this sort and that, Dakota can stand an occasional cold wave. One thing about Dakota's weather, there is no alternating 'freeze and thaw,' as the states to the east experience every winter and spring."

WONDERFUL DEVELOPMENT.

Letters from Golden Latitudes: "It is not easy to realize that when, during the closing days of Buchanan's administration, there was organized as the territory of Dakota an immense tract of country, equal in extent to the empire of Austro-Hungary, the entire white population of that vast region was not more than sufficient to make a New England village, or to fill two good sized churches.

Even so recently as 1870, the territory having in the meantime been reduced to its present limits, leaving it about one-fourth larger than Great Britain and Ireland, its inhabitants numbered but 14,181.

But its present population, although exceeding six hundred thousand, does not, even in the light of the foregoing significant statements, constitute an adequate expression of the growth and development of the territory. That population consists almost entirely of producers, and the grain they raised last year averaged a larger number of bushels per capita than did the production of any other state or territory.

One cannot but wonder whether the solitary pioneer whose forty acre field yielded him in 1859, 945 bushels of wheat, which constituted the entire crop of the territory, had any prevision of the coming time when the Great American Desert, as it was then called, should wave with golden grain.

Midway between that dauntless pioneer and the generation that shall witness the full fruition of present promises, we stand to-day.

We see the territory yielding as the crop of a single year, 60,000,000 bushels of wheat, exceeding the product of any other state or territory; 40,000,000 bushels of oats, 25,000,000 bushels of corn, 4,000,000 bushels of flax, nearly half the product of the Union, and millions of bushels of other cereals.

We see it with 4,500 miles of railroad; with 4,000 schools; with 400 newspapers; with 300 banks; with 1,000 postoffices; with hundreds of churches of various denominations, and paying out for school purposes more than any one of twenty-four states, and collecting more postal revenue than thirty of the states; we see it with high educational institutions; we see it the queen among the territories.

If he who makes two ears of corn or two blades of grass to grow upon a spot of ground where only one grew before deserves well of mankind and does essential service to his country, what shall be said for those who have, upon so gigantic a scale, subjected the refractory powers of nature; converted, if not a wilderness, at least a fruitless plain, into a fruitful garden; and whose production of wheat alone is, after allowing for their own requirements, sufficient to feed the whole of New England, with thirteen other states and territories thrown in."

THE RAINFALL FOLLOWS THE PLOW.

Moses Folsom in The Burlington Hawkeye: The prediction a dozen years ago that the territory of Dakota would, in the year of our Lord 1888, have 600,000 population, 4,500 miles of railroad, 4,000 public schools, 400 newspapers, 300 banks, and produce in one year 60,000,000 bushels of wheat, would have been laughed at. It is the regular habit of poor simple humanity to laugh at and ridicule those who aspire to make better its condition. With slow and feeble steps humanity emerged from barbarism, tempted at each movement by ignorance that starved it, by follies that killed it in war, by cowardice that kept it in slavery, by stupidity that brought misery and suffering. Galileo said the world moved, and to save his life had to take it back, but the old ball kept rolling just the same. He was laughed at by the wise men of his day, and so was Columbus. Newton was laughed at and so was Fulton, and Morse, and Edison. DeLesseps couldn't dig the Suez canal, but he did. The Dutch, big of brawn and brain, were laughed at when they proposed to build dykes to hold back the water and make gardens of the seabed. The project to connect the continents by ocean cables was derided, and statesmen ridiculed the building of a Pacific railroad. The trans-Missouri country was a desert, so the books said a generation back, and those bold enough to invade and cross the wide domain were veritable heroes. It may have been a desert, but it is not one now. The advent of the white man, with his railroads and mining tools, his plows and domestic animals, his orchard and forest trees, his breaking of the sod and the cultivation of plants, may account for the transformation. When man went out on the plains the rain cloud followed and then came the tame grasses pushing out the coarse herbage, as the pale face drives away the Indian. Whether it is the iron rails and the telegraph wires that have established new electrical conditions, or the rushing of the trains, the planting of trees, or the stirring of the soil, or whatever the cause, the rain line has gone west and man and civilized vegetation hold the conquests gained.

I heard an old farmer talk one day,
Telling his listeners how
In the wide new country far away
The rainfall follows the plow.

"As fast as they break it up, you see,
And turn the heart to the sun,
As they open the furrows deep and free,
And the tillage is begun

The earth grows mellow, and more and more
It holds and sends to the sky
A moisture it never had before
When its face was hard and dry.

And so, wherever the plow-shares run,
The clouds run overhead.
And the soil that works and lets in the sun
With water is always fed."

I wonder if that old farmer knew
The half of his simple word,
Or guessed the message that heavenly true,
Within it was hidden and heard?

It fell on my ear by chance that day,
But the gladness lingers now,
To think it is always God's dear way
That the rain-cloud follows the plow.

WHAT WE CAN RAISE AND WHAT WE CAN DO WITH IT.

Beadle's Geography of Dakota (published by D. D. Merrill, St. Paul, Minn., to whom we are indebted for the illustration of the capital building used on the first page of this publication) says in substance that farming or stock raising must always be the chief employment of our people, and our principal manufactures must be from what we raise on our lands. From our wheat and oats we can make flour and meal. From corn we can obtain starch, hominy, meal, sugar and syrup. Our pastures will support countless herds of cattle, furnishing beef, and milk for butter and cheese, and hides to be tanned and made into boots and shoes. We can raise sheep and manufacture their wool into clothes. From our flax fibre we can make linen and bagging, and binding twine, and from the seed make oil and cake. From potatoes we can make starch. We can raise field peas and barley and fatten hogs for packing houses. It is wonderful what we can raise and the uses the products of field and pasture can be put.

GUARANTEES OFFERED TO SETTLERS.

Correspondence of The New York Weekly Witness: "There is a good deal of rubbish printed in the eastern newspapers about cowboys, Indians, blizzards, etc., which belongs entirely to the sensational. A man in coming to Dakota can get government reports and statistics concerning the climate and full information about the productions of the soil. The official reports, the returns of actual weights on the scale beam and the balances on the right side of the ledger are among the guarantees that Dakota can offer to settlers. The plain truth is that people who come to Dakota and accustom themselves to the country and exercise good sense and industry can succeed as well as anywhere in the country. Why renters should till the high-priced farms of the East, with scanty living, and divide earnings with landlords, each year paying out more than the cost of getting a farm of their own, is certainly because of ignorance of the facts. To capable, self-relying and self-denying men Dakota offers cheap and permanently productive soil, a maximum of results for the minimum of toil, easy access to markets, good church and school facilities and a healthy climate."

Let the reader make his comparisons, and if they are fairly made he will find Dakota always scoring as many points of advantage as can be justly claimed for any other country in the world.

TAKES HIGH RANK.

Editorial correspondence of The Western Rural and American Stockman: "The territory of Dakota now stands at the head of wheat production, and will soon take high rank in breeding fine stock. Indeed it does now. Its climate is in no sense a terror. It is true that the winters are cold. But so they are in Chicago, and the frequently made statement that the severest cold of Dakota is not felt as the severe cold of Chicago is, is true, and is true because the atmosphere is drier. We saw stock in Dakota that had come through the winter with a pretense of shelter that would not answer in the latitude of Chicago at all, and the stock looked as well as any stock could look. The effects of blizzards and cyclones we did not find. Indeed the first impression that one will get from the general appearance of things and from the testimony of both interested and disinterested people is that a Dakota blizzard is a thousand per cent worse in the newspapers than it is in Dakota. That the climate is one of the most health-giving there is abundant evidence. The people are robust and strong, some of them have become so after having come here as invalids."

FACTS FOR HOMESEEKERS.

The time to come to Dakota is now; "Now is the the accepted time."

Homesteads, pre-emptions and tree claims are not taxable until final proof is made.

Every forty acres of an average Dakota farm, rightly tilled, will produce a living for the largest family.

An acre and a half of ground could be given to each of 60,000,000 people should so many ever crowd into the Dakotas.

Eastern people always admire the good roads in Dakota. We have very little mud, and the rule is good wagon roads.

The $3,000,000 worth of church property in Dakota is strong evidence that in religious matters we are not so very far behind our sister states.

Wise and far-seeing farmers and young laborers whose toil the rugged and scanty New England farm scarcely repays, should come to Dakota.

The pioneer in Dakota has had no such hardships to encounter and overcome as his parents faced on entering Ohio, Indiana, Illinois and Iowa.

The two Dakotas enjoy the confidence of financiers and capitalists. This will be increased by the admission into the Union of the two giant young states.

In thirty-seven of the principal counties in Dakota there are 41,000 acres of growing and cultivated forest trees. In some of the older counties these trees have reached large size.

Maps of the two Dakotas, together with miscellaneous printed information of an interesting character, is sent free on application to the commissioner of immigration at Aberdeen, Dakota.

One-third of the area of the two Dakotas sown to wheat and producing fifteen bushels to the acre would make a crop of 500,000,000 bushels, or more than the total yield of the United States for 1888.

Dakota has all of the advantages of a new country in the way of cheap lands and rich soil, with all the conveniences of an old country in the shape of railroad and postal facilities, markets, schools, etc.

In five years the Dakotas have spent $10,575,117.87 for schools. This money was raised by direct taxation. So long as the territory existed none of the public land was available for school purposes.

A Union (S. D.) county farmer planted trees in 1868, out of which he has recently cut 75 cords of wood and 58 logs which will square from 10 to 16 inches, from 10 to 15 feet in length. The wood is worth $5 a cord.

The financial condition of Dakota is excellent. The receipts by the treasurer for the two years ending Nov. 30, 1888, amounted to $1,655,405, and there remained in the treasury at that date a balance of $94,890.

Sheep raising is an industry one can engage in with small capital. The increase is so rapid that a good sized flock will soon be accumulated. Reports of fine profits from sheep come from all parts of the Dakotas.

Dakota contains the largest area of good farming land unoccupied in the republic, of which 320 acres (homestead and tree claim) are free to each occupant without impossible conditions, and close to railroads and markets.

The laws of Dakota are very favorable to tree planting, but the fact is not generally understood. The man who plants trees not only has property exempted from taxation, but is actually paid a bounty out of the public treasury.

Our climate is one of the most delightful in nature. High, dry, bracing and salubrious, consumption was never known to seize a victim here; on the contrary those suffering from pulmonary ailments have been cured by coming.

The future of Dakota was never so full of promise. All parts of the two coming states show an increase in population, wealth, and all that can contribute to the fulfillment of brilliant destinies.

The dry air of the Dakota winter exhilarates and builds up. The states of the cold part of the temperate zone are healthier than those of the warm and semi-tropical sections of the country. The same rule, that cold climates are more healthful, holds good in Europe. Cold is conducive to vigor and strength, while heat debilitates and weakens.

Dakota extends a hearty welcome to home seekers, and will reward their industry by generous returns. Millions may accept the proffered hospitality without exhausting the ample board which Dakota spreads upon her "table" lands.

Remember you are not going on to the frontier in coming to Dakota. Schools and colleges abound; churches of all denominations are established, and you find yourself at once in the midst of educated, refined and intelligent people.

It will be on record for the winter of 1888-9 that Dakota farmers worked on the land, plowing, pulverizing and dragging, during November, December, January, February and March—more or less in every month of last fall and winter.

Dakota offers cheap farms and good climate to eastern farmers who have vainly toiled for years to get ahead or to pay off "the little mortgage," or their grown-up sons to whose sturdy labor the little farm no longer offers adequate returns.

The grass in Dakota does not die or decay the year of its growth, but is suncured during the summer and remains on the ground as nature-made hay. The decay does not begin until the following year, after the snow has melted and spring rains fall.

The young men of the Middle and Eastern states will never have the same opportunities again which are held out to them to-day in North and South Dakota. They should bear this in mind and decide about coming before the year 1889 is ended.

Dakota is nearer to great markets than Kansas or Nebraska, while Duluth, the great lake port, gives it direct water connection with Europe. Nearness to Duluth also gives Dakota advantages in getting hard coal not possessed by states further South.

There are hundreds now owning good farms in Dakota, free from incumbrances, who began with absolutely nothing and had to hire themselves out before they could even pay the land office fees for the claims they took up. A man who wants work can always find it at good pay, besides gaining some practical experience before starting on his own account.

Dakota's offer for 1889 cannot be duplicated anywhere else in this country, or on the face of the globe. If you are thinking of moving West, or of providing for your children, consider the offer in time and you will probably accept it. But don't delay about coming.

All reasonable inference tells us that the Dakotas will far outstrip the older states of the west in rapidity of development, as the land seeker and home seeker upon the iron horse outrides the pioneers of Indiana, Illinois and Iowa in their slow moving wagon trains.

Fruits come last always among the farm and garden products of a new country. It is remarkable, however, what Dakota has accomplished thus far in this direction. Newcomers should have no fears of not being able to have their own orchards and berry patches.

No one need be deterred from coming to Dakota for fear of being deprived of his favorite garden luxuries. On the contrary, the newcomer will be agreeably surprised by the rapid growth, superior quality and luxuriant yield of all the best kinds of Northern garden products.

Dakota is exempt from malaria, and consequently the many diseases known to arise from it. Not only are we free from such ailments, but persons coming here afflicted with malarious complaints generally recover without medical treatment. We never have had any epidemics.

The two Dakotas now offer, in addition to over 20,000,000 acres of free public lands, the advantages of statehood and the enjoyment of all the blessings of constitutional government on a sound basis. There are no more objections to be met on account of the territorial condition.

In Dakota the farmer has an average in his farm property of only $5 per acre, and he raises a finer grade of wheat and more per acre than the Eastern farmer with many times the amount invested, and with a corresponding increase of annual outlay for taxes and interest on the investment.

If the tin mines of the Black Hills prove to be what the prospects indicate, that useful metal will be the source of great income, and make Dakota the first tin producing territory in North America, as it is already the fourth among the

American commonwealths in the production of gold, and ninth in silver.

The people of Dakota have been public spirited and liberal in the construction and support of educational, charitable and penal institutions. The value of the public buildings and land exceeds $2,000,000. The amount appropriated for the support of the various institutions for the last two years was $698,450.

The renter expends his energies for another. To occupy and begin the cultivation of a homestead means the immediate creation of a property worth from $1,000 to $1,500, and every year thereafter the equivalent of a laboring man's wages for twelve months back East will be added to the value of the farm.

Coal is found in all parts of the west half of Dakota. Outcropping and other indications of the presence of coal veins have been found at many points in Southeastern and Central Dakota, and in Northern Dakota, which lead to the belief that the coal area will eventually be extended over most of the surface of all Dakota.

Now is the time to come to Dakota and enjoy the growth and stimulus that must follow statehood. Under the new conditions capital will flow in, commercial enterprises and manufactures be inaugurated and the new comer will be on hand and become a factor in helping to create the society and government of the state.

Cheap hay and grain, and extensive ranges, make it possible to raise horses, cattle, sheep and hogs with greater profit in Dakota than almost any other section of the United States. Dakota, too, has direct railroad connections with the great Western markets. St. Paul, Duluth, Minneapolis, Omaha, Sioux City, Milwaukee and Chicago.

The man who is now engaged in a ceaseless and nearly hopeless struggle to win a home and assurance of comfort in coming old age, in the crowded East can better his condition and improve his prospects by coming to the free land of Dakota, if he is willing to continue the effort and practice the economy necessitated in his old home, in his new one.

In every part of Dakota will be found men who began without anything, except a will to work, who now have from a quarter to a full section of land, with buildings, machinery and stock, and consider themselves worth from $5,000 to $20,000. Instances are common where farmers have sold as high as $3,000 worth of crops from a single quarter section in one year.

England, Norway, Sweden, Northern France, Germany and Denmark are all far north of the northern boundary of the territory, and the same parallel of latitude which passes through its central portion runs through Southern France, Northern Italy and Austria. Dakota extends only from latitude 42 deg. 30 min. to 49 deg., barely half way from the equator to the north pole.

In leaving the East no man takes himself away from first-class schools, good churches, ably-conducted newspapers or any of the desirable conditions of Eastern society. He will everywhere find in Dakota, keen, bright, well educated men who will converse with him on any subject, from the price of wheat and pork, to the nebula hypothesis or the philosophy of Aristotle, Bacon or Kant.

Dakota raises as good flax fibre as in Ireland, where the best linen in the world is made. This fibre will make good twine, far better than the semi-tropical product for which the territory annually pays hundreds of thousands of dollars. Flax is one of the best of sod crops, the seed alone often netting the farmer from $15 to $20 an acre, the fibre or straw being burned to get it out of the way.

The Scientific American, in a recent article, pronounced the James river valley one of the most remarkable agricultural valleys of the United States. It is over 300 miles long, and entire townships of land can be plowed without obstruction. It is also the greatest artesian well district known, having already fifty wells of the heaviest known pressure and volume, the largest number of successful wells in any equal area in the world.

The man who moves from an old and well settled country to a new and sparsely settled one, will of necessity have to commence life again under greatly changed conditions, some of which may not be entirely agreeable, but use will soon familiarize and habituate him to the change for the present and the future compensate him for a few minor deprivations by greatly enlarged opportunities, leading to high accomplishments.

Because Dakota is young it will not do to assume that it is destitute of the modern necessities of civilized life. The Western man quickly hears of whatever is new in science, religion, art, literature or business. As he is vigorous of intellect and quick of motion, he has adopted and is using the telephone or the electric light before the thing has been fully understood outside of the large cities of the East.

Dakota is shown by the board of education to be second to none of the older states in the provisions made for the education of the children from the common school upwards to the high school, the college and the university. The system of education has been built on a broad basis, and provision is made by the state to enable every child, rich or poor, to obtain a thorough education practically without expense.

Dakota flour, made from No. 1 hard wheat, cured naturally, contains 3 per per cent. less moisture than California flour, made from wheat dried in kilns, and will make proportionately more bread; a comparison with Eastern flour disclosed a difference in bread-producing capabilities amounting to no less than fifteen pounds of bread in every 100 pounds of flour, in favor of the product of Dakota wheat.

Spend a year or two in Dakota enjoying the delightful autumns, the bracing winters, the exhiliarating springs, the balmy summers, and then go back East. Go out and get your feet wet, wade around in the slush, face the sleet, get a cold in your head, have shivers, such as the coldest weather cannot bring to you in this climate, and come back satisfied, as you will be, that taking the whole year round, Dakota has as good climate as any in the world.

The life in Dakota to which the Eastern man is invited does not involve the surrender of many of the comforts or the privileges to which he is accustomed. Even if he begins at the beginning and builds himself only a sod shanty on government or railroad land, his children will be able to attend school and his wife to make new friends just as good and true as those whose society she now enjoys; while, in the matter of religious privileges, he will find the Christian churches vieing with each other in their regard for the spiritual interests of this new country, and it will be but a short time before the sod shanty is replaced by a well-built house, and all the conveniences and pleasures of the Eastern home are again renewed, with the addition of being surrounded by a large and valuable farm.

Dakota offers, for 1889, the established results of the previous decade of the most remarkable development and progress ever witnessed in the settlement of this country. A hospitable people, cultured society, an excellent public school system with ample funds, fine buildings and good schools, churches of every denomination, commercial facilities of a high order, railroad advantages equal to any, the conveniences of modern city life, and the comforts of country homes situated within a short distance from market, railroad and telegraph combine to render one's moving to Dakota a most agreeable matter.

The Dakota granite, or Sioux Falls granite, as it is better known, is found at Sioux Falls, Dell Rapids and elsewhere, in deposits estimated by the United States geological survey at 3,000 to 4,000 feet in thickness. The quarries are simply inexhaustible. It is susceptible of a high polish and comes in a variety of pleasing shades, such as chocolate, terra cotta, red and yellow. An $80,000-plant for polishing the stone has been in successful operation at Sioux Falls for several years, the output consisting of columns, bases, and various other designs in ornamental building and monumental work. The rough stone, chipped into small blocks for paving purposes, is sold extensively in various Eastern and Western cities.

Persons who do not care to go to the thinly settled regions can find relinquishments of homesteads in many parts of the territory. A great many persons take up land who are neither farmers—which the land laws do not require entrymen to be, by any means—nor disposed to undertake the necessary improvement required among the acts of good faith essential in a final proof paper, which is something the law does very properly insist upon. So they relinquish or sell out. Tree claim relinquishments are capital catches, for the five or ten acres of breaking come in number from non-residents, who grow tired of waiting for the trees to grow from the seed, while all the time apprehensive that through some carelessness or neglect of the parties who are taking care of their interests their claim may be jeopardized, or their land fever having subsided, sell for a small amount.

The artesian well promises to cut a large figure in the development of Dakota. In the East cheap fuel and natural gas have worked wonders in securing manufacturing industries; in Dakota the artesian wells are a substitute for both and will furnish an everlasting motive power which is already being utilized with economy and satisfaction to run machinery, besides furnishing water for irrigating and fire purposes.

The abundance of all the year round pasturage and easily obtained forage crops have given Dakota a standing as a meat producing state. A distinguished botanist says: "The grasses are proverbially in perfection only in Northern and cold regions. It is in the North alone that we raise animals from meadows and are enabled to keep them fat and in good condition without grain." Nowhere in the United States are the grasses more abundant and nutritious than in Dakota.

Congress has not yet repealed the preemption and timber culture acts, but in view of the rapid disappearance of the last of the public domain, will probably agree on some repealing measure this winter. At the same time the homestead law may be amended, so as to exact the full term of residence required in each case. It behooves people who want a couple of claims on the present easy terms of the government to lose no time in coming out to Dakota to make sure of their land this year.

A settler on a prairie farm in Dakota does not have before him the task of a lifetime, of felling trees, cutting brush, grubbing, clearing and stump-pulling, which a location in a heavy timbered country invariably requires; nor has the prairie farmer the melancholy experience of the settler in the woods, that after years of perseverant labor in hewing down a forest. the work may have to be transferred to his heirs, while to him the end of a busy life with unremitting toil is at hand. The Dakota farmer can crop an entire 160-acre farm the second year, and do it all himself.

The climate of Dakota seems especially adapted to rearing of horses, cattle, hogs and sheep. Horses have better lung capacity and endurance than those grown in stables and fed on grain. There are no sleet storms or mud in winter, and foot-rot, catarrh or scab is unknown among sheep. In the dry healthy air the increase among sheep is greater than in the moist climates and lambs are stronger and make better mutton. The territory also enjoys immunity from the hog cholera, and fine hogs have been raised in all parts of the territory without the use of a single grain of corn. All kinds of poultry thrive.

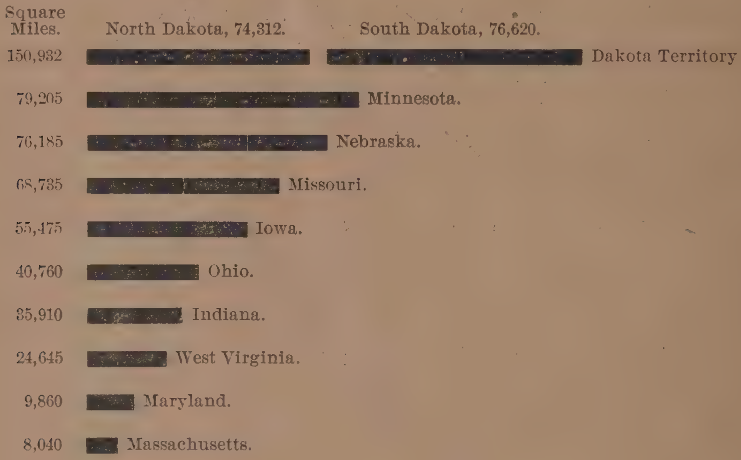
The cold of the Dakota winter is not what the thermometer indicates. Northern people suffer more in the winters of the Southern States than in Dakota, for this reason: The Dakota air is dry, and dry air is a poor conductor of heat, while air saturated with moisture at from zero to 50 above is a conductor and rapidly absorbs bodily heat and produces those chilly and benumbing sensations which make life so uncomfortable and unsafe in the Gulf, Lake and Atlantic states. Air at 20 degrees below zero contains only one-twenty-fourth the moisture that it does at 20 above. The extreme dryness of the Dakota winter air explains the ease with which houses can be kept warm. the homesteader passing the winter in cosy comfort in his shack of boards and tar paper, without the roaring fire of the South and East, where the sleet, the snow, the rain and mud cover half the year. Dakota being remote from the oceans, has but little moisture in the air during the cold season.

Dakota has a large number of higher institutions of learning. In addition to the state universities of North and South Dakota, and the other territorial institutions proper, to which reference is made elsewhere, there are nine colleges supported under educational auspices as follows: Yankton college, Yankton, Congregational; Sioux Falls university, Sioux Falls, Baptist; Dakota university, Mitchell, Methodist; Pierre university, Pierre, Presbyterian; Groton college, Groton, Presbyterian; Redfield college, Redfield, Congregational; Jamestown college, Jamestown, Presbyterian; Fargo college, Fargo, Congregational; Tower university, Tower City, Baptist. The Episcopalians have All Saints school, at Sioux Falls; the Presbyterians two academies at Scotland and Arvilla; the Norwegian Lutherans a college at Canton; and the Catholic church five parochial schools and convents at Yankton, Aberdeen, Fargo, Grand Forks and Bismarck. Commercial or business colleges are established at Yankton, Sioux Falls, Aberdeen and Fargo.

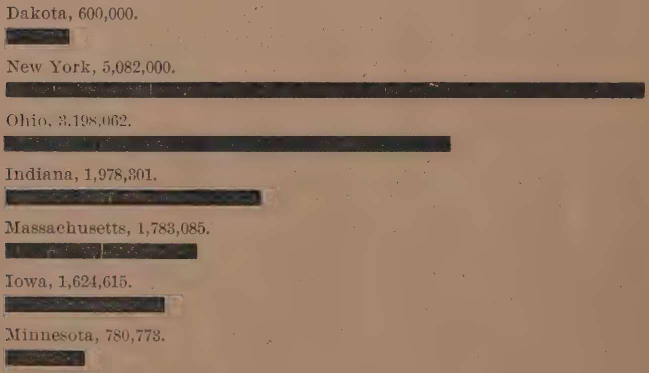
DAKOTA COMPARED

IN AREA AND POPULATION WITH OTHER STATES.

Not every one has an idea of the great size of Dakota as a whole, or even divided. The following diagram, giving the square miles of several leading states, as compared with the two Dakotas, may aid in establishing correct impressions:



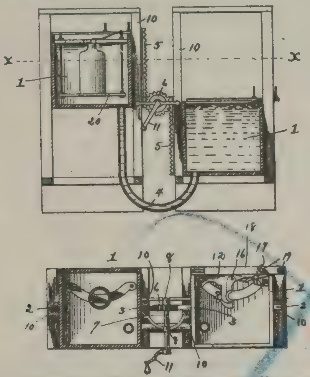
While Dakota overshadows many of the States in area, in population the contrast is the other way, as the following, from latest estimate, will show:



and a cam-shaft for agitating said grate-bars, in the rear, in combination with the ash-grate I, in the manner substantially as and for the purpose set forth.

4. An automatic coal feeder and stoker consisting of a series of detachable, perforated and hooded grate-bars, resting on a bar forward and a cam-shaft in the rear, an ash grate, the bin and hopper, said hopper having a series of tubes piercing the rear support thereof, the floor Z and doors Z′, with the mechanism for operating the hopper and cam-shaft, substantially as described.

489,543. APPARATUS FOR MECHANICALLY OPERATING PASTE-GLASS MOLDS. Michael J. Owens, Toledo, Ohio. Filed May 12, 1892. Serial No. 432,723. (No model.)



Claim.—1. A plurality of oppositely vertically movable tanks adapted to contain water, a mold arranged in each tank and a flexible conduit connecting the oppositely moving tanks whereby as one is elevated the water will flow into the lowered one.

2. In an apparatus for operating paste glass molds a plurality of vertical movable tanks each carrying a mold, and a flexible conduit between the tanks, in combination with means for raising and lowering the tanks alternately.

3. In an apparatus for mechanically operating paste glass molds, a plurality of vertically movable tanks each carrying a mold, and a flexible conduit between the tanks, rack bars attached to the tanks and a pinion engaging the rack bars for raising one tank and lowering the other.

4. In an apparatus for operating paste glass molds, the combination with a tank adapted to receive water, a mold arranged in the tank and an adjustable track or support for securing the mold in the tank.

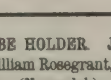
5. In an apparatus for operating paste glass molds, the combination with a tank adapted to receive water at stated times, of a sectional mold arranged therein, and a track or support adjustable with relation to the tank for holding the molds in place.

6. In combination with a sectional paste glass mold a mold, a tank, and means for wetting the mold in the tank, a support for the mold and an insertible bottom for the mold carried by the support.

7. In combination with a sectional paste mold, a tank in which the mold is secured, a support for the mold and an insertible bottom for the mold carried by the support.

489,544. SYRINGE-TUBE HOLDER. James C. Parker, Woodston, assignor of one-half to William Rosegrant, Alton, Kans. Filed June 20, 1892. Serial No. 437,290. (No model.)

Brief.—A rubber sucker retains the inlet end of a syringe tube in firm contact with the bottom of the liquid vessel.

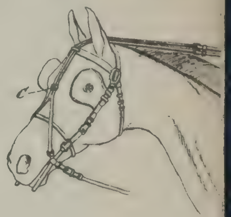


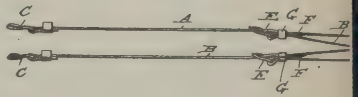
Claim.—1. A holder for the feed tubes of syringes, pumps, &c., comprising an elastic bell-shaped sucker attached to the inlet ends of such tubes, as specified.

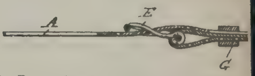
2. In combination with the suction-tube of a syringe, or similar article, a holder comprising a hollow shank, communicating with the

---

489,545. BRIDLE-CHECK. John M. Qu
Bacon, Sanborn, Iowa. Filed July 23, 1892.
model.)



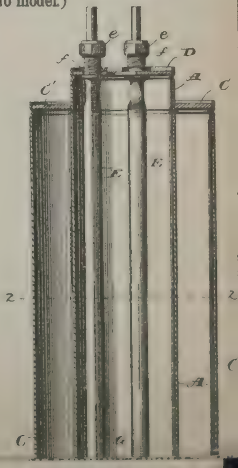




Claim.—1. In a check rein, the combinat
with a pair of guides and adapted to be conn
and the two straps A and B, strap A having
through one of the guides in said plate and e
connected directly to strap B at a point betw
forward end and strap B having its rear enc
other guide and extending forward and conn
mediate its ends, the front ends of straps A
with means for attaching them to the bit-s
described.

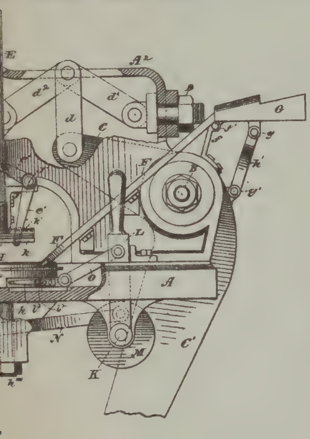
2. In a check-rein the combination of a
pair of guides and adapted to be attached to
straps A and B provided with buckles C C at t
each having its rear end passed through on
plate and carried forward and passed through
secured on the main part of the other strap
both straps being folded back between the n
and the forwardly extending part of the oth
on the straps to hold them in their adjusted
as and for the purposes described.

489,546. BEER-COOLER. Edward J. R
signor to Theresa Rice, same place. Filed J
439,360. (No model.)



nation with the inner receptacle and the outer ate B forming a bottom to the outer chamber rtion extending above and below the plate extended into the inner receptacle, a remov- ured to the lower end of the tubular portion, the upper end of the inner receptacle, the eptacle and passed through the top plate and te F, the overflow pipe arranged centrally in held in the bottom plate F, and suitable coup- ubstantially as shown and described.

CHING AND RIVETING MACHINE. RALPH J. , Conn., assignor to the Holmes, Booth & Haydens ov. 24, 1891. Serial No. 413,003. (No model.)



eting machine, the combination of the rotary rotating said carrier, a punch or needle mov- a hole in said carrier a rod consisting of two er carrying said punch or needle and a con- aid lever and the upper portion of said rod needle may be tipped by a movement of the pecified.

achine the combination with the bed of a ro- in a recess in said bed, and having peripheral to the machine, a dog operated by said lever vertically movable and tilting punch or needle vith said lever for tilting the punch or needle, d.

achine the combination with the bed of the ro- id bed and having peripheral notches, an an- said carrier, a lever pivoted to the machine, lever to engage in a notch of the carrier and ovable and tilting punch or needle and means ver for tilting the punch or needle, substan-

chine, the combination with the bed of the ro- ed in a recess in said bed and having lateral ising a hand power for rotating said carrier, ls at the inner ends of the lateral openings, and which rivets are automatically fed into the carrier, substantially as specified.

achine the combination with the bed, of the ro- on, an annular series of anvils seated in the nvil having a vertical hole and a punch or h said holes for punching a hole through ma- acing a rivet therein, the other anvils of the ovable at the inner ends of lateral openings in y as specified.

achine the combination with the rotary rivet operating hammer, means, a rock lever and the hammer, and resilient fingers carried by a washer, substantially as specified.

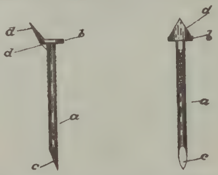
chine the combination with a hammer, having gers the rock lever, the links, *d*, *d'*, *d²*, *e*, *e²*, between said lever and hammer and a washer feeder, substantially as specified.

9. In a riveting machine the combination with a rotary rivet carrier having openings for rivet anvils, rivet anvils movable vertically in said openings, the said openings a cam for moving the anvils vertically having lateral openings, and a chute, substantially as specified.

10. In a riveting machine, the combination with a chute for rivets, of a rotary carrier having vertical openings provided with lateral openings at their upper portions adapted to be moved in line with the mouth of the chute, an anvil movable in each of said vertical openings and a cam surface for moving the anvils vertically, substantially as specified.

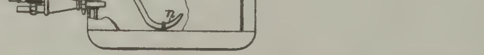
11. In a riveting machine, the combination with a vertically movable hammer and means for adjusting its movement, of a vertically adjustable washer feeder adjacent to the hammer, a set screw for securing it as adjusted a feeder bar for feeding a washer to the hammer, a connection between the hammer and feeder bar for moving the feeder bar in one direction and a spring for moving it in the opposite direction, substantially as specified.

489,548. SHOE-NAIL. CHARLES E. SLOCOMB, Everett, Mass. Filed July 11, 1892. Serial No. 439,681. (No model.)



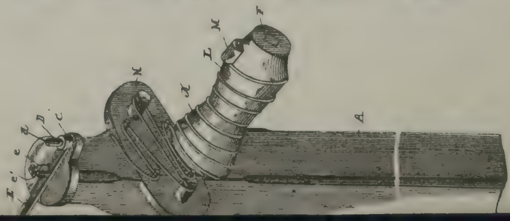
Claim.—The nail herein described consisting of the shank *a*, pointed at one end and having the flanged head at the opposite end, one half or portion of which as *b*, has a flat top, and the other half or portion of which is formed as a short tapering spur *d*, projecting obliquely with relation to the part *b*, and the prop or support *d'*, beneath the base of said spur, substantially as described.

489,549. OIL-BURNER. CHARLES T. SMITH, Cleveland, Ohio, assignor of two-fifths to Charles R. Bosworth, same place. Filed Feb. 4, 1892. Serial No. 420,316. (No model.)



Claim.—In combination with an oil burner for kindling the fire for a boiler, a nozzle of substantially the form described, attached to the terminal of an extending pipe, reaching from said burner into the base of the fire or fuel substantially as and for the purpose set forth.

489,550. BED-SPRING-COILING MACHINE. GEORGE I. STARK, McKinney, Tex., assignor of two-thirds to Charley H. Stark and Thomas J. Stark. Filed Aug. 4, 1892. Serial No. 442,152. (No model.)

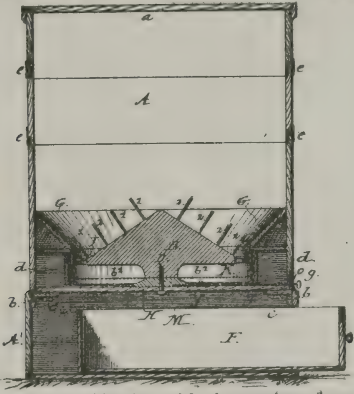


2. In a machine for the purpose named, the combination with a standard, and a rotatable shaft mounted in bearings thereon and provided with oppositely disposed coiling cones, one of which is removable, of the bending mechanism, comprising a permanent vertically-slotted pin, and a lever fulcrumed upon said pin and carrying a stud provided at its opposite sides with notches to engage the wire, all substantially as specified.

489,551. ELECTRICAL DIAPHRAGM. CHARLES N. WAITE, Newton, Mass. Filed Mar. 16, 1892. Serial No. 425,165. (No specimens.)

Claim.—An electrical diaphragm consisting of a sheet or layer of acid resisting fibrous material and bi-chromatized gelatine, substantially as set forth.

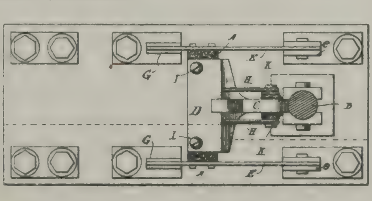
489,552. BIN FOR FLOUR, MEAL, &c. EPHRAIM ALPAUGH, Galt, Canada. Filed Aug. 7, 1891. Serial No. 402,046. (No model.)



Claim.—1. The combination with the receiver, formed as described, of the oscillatory pulverizer, pivoted in the bar at the base of the bin, having a body or conical form and provided with spikes on its inclined and upright surfaces as and for the purpose specified.

2. The combination with the bin, the pulverizer, as described, and the sieve arranged to oscillate with the pulverizer, of the bar *g* adapted to agitate the said pulverizer and sieve, as and for the purpose set forth.

489,553. ELECTRICAL SWITCH. GEORGE BAEHR, Brooklyn, N. Y., assignor to Samuel O'Connor, same place. Filed Mar. 26, 1892. Serial No. 426,504. (No model.)



Claim.—1. In an electric switch, the combination, of a pair of circuit controlling blades, a cross bar of insulating material mechanically connecting them together, a manually operated swinging lever provided with two jaws loosely embracing said cross bar, and a spring bearing at one end against the lever and at the other end against the cross bar, substantially as and for the purpose described.

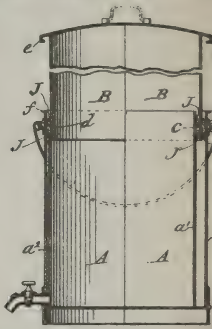
2. In an electric switch, the combination, of a pair of pivoted blades mechanically connected together by a cross bar and a swinging lever provided with a pair of jaws loosely embracing said cross-bar, one of said jaws being widened or extended into a web to form a large bearing surface against the bar as set forth.

3. In an electric switch, the combination, of a pair of pivoted blades, a cross bar of non-conducting material mechanically connecting them together, a reinforcing plate for said cross-bar, and a lever acting against said cross bar to operate the switch, substantially as described.

4. In an electric switch [illegible]

the said plate D and into cavities formed in th
tially as and for the purpose described.

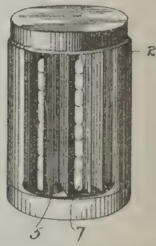
489,554. MILK-CAN, &c. EDWARD L. C
Filed Mar. 25, 1892. Serial No. 426,465. (N



Claim.—1. The combination in a vessel
air pressure, of a chamber for containing the
per end an out turned slotted flange, of a cap
having a prolonged cylindrical portion to fit
ber adjacent to the walls thereof to constitu
chamber, and provided at its upper end with a
wardly extending flange, having an inwardly
slotted portion of the flange to the liquid cha
said flange whereby it may be held in place a
within the vessel, substantially as and for the

2. The combination in a vessel for storin
ure, of a liquid holding chamber having an i
to form a space between the two, of a cap or
having a prolonged cylindrical portion workin
the two walls of the lower chamber and consti
ing piston, and a catch for holding the cylin
the lower chamber against the air pressure t
and for the purposes described.

489,555. ADVERTISING DEVICE FOR
T. CROSSLEY, Duluth, Minn. Filed Dec. 24, 1
(No model.)



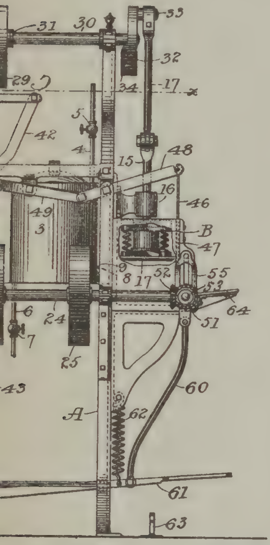
Claim.—1. In a device of the class desc
with a glass vessel, of a core arranged therein
or indentations upon its outer surface adapte
the articles to be displayed in contact with the
means for lifting the same together with the
sel, substantially as described.

2. In a device of the class described, the
vessel having vertical sides or walls, of the ind
in, the false bottom fitted to said vessel beneat
for lifting said base with said core and its co
substantially as described.

3. The combination with the glass vessel 2
therein, having the grooves or depressions 4, th
to said vessel and supporting said core, and me
tom from said vessel with said core, substanti

489,556. STARCHING MACHINE.

in one of its sides adapted to be opened to
arment and to be closed down upon the gar-
er portion from the starch, the piston work-
nuously running source of power, and means
into gear with said source of power, and si-
id gate, substantially as described.
achine, the combination with the rectangular
ston fitted to and working therein, a lateral
ion of the garment into said box, and means
upon the interposed garment, substantially as



nachine, the combination with the starching
to receive the garment, of the roll journaled
ne side of the said opening, the continuously
, the clutch upon the shaft of said roll adapted
with said source of power, the roll arranged
aid opening journaled in bearings movable to
l, and means engaging said clutch for shifting
eby said rolls are thrown into gear with said
losed together, and thrown out of gear there-
ubstantially as described.
nachine, the combination with the starching
to receive the garment, the gate for closing
n working in said box, its crank shaft, the
ource of power, the mechanism for simulta-
ank shaft into gear with said source of power
nd for simultaneously raising said gate when
vn out of gear with said source of power, sub-

nachine, the combination with the starching
ing therein, the opening in said box to receive
t, the sliding gate adapted to close said open-
he interposed garment, the roll journaled in
bottom of said opening, the roll journaled in
gs above said first roll, the continuously run-
nd means for simultaneously closing said rolls
ment, and throwing the same into gear with
ereby the garment is automatically withdrawn
and the surplus starch stripped therefrom into
as described.
n of the starching box having a lateral open-
of the garment, the indented piston working
closing said opening upon said garment, the
earings at the bottom of said opening, the roll
he top of said opening in bearings slidable to
ll, the continuously running source of power,
neously closing said rolls together upon the

the piston working therein, an opening in said box through which a portion of the garment may be inserted, a gate for closing said opening adapted to bear upon said garment when in position and to protect the outer portion from the starch, the stripping rolls arranged adjacent to said opening, one on each side of said garment when in position, the continuously running source of power, means for closing said rolls together upon said garment, and simultaneously throwing the same into gear with said source of power, and means for simultaneously separating said rolls and throwing them out of gear with said source of power, whereby the garment after being starched is withdrawn from said box and the surplus starch stripped from it into said box, and the opening then left free for the insertion of another garment, substantially as described.

11. In a starching machine, the combination with the starching box and the indented piston working therein, of the roll journaled in fixed bearings on one side of the opening to said box, the roll journaled in bearings movable to and from said other roll, on the opposite side of said opening, the gate for closing said opening, the continuously running source of power, means for simultaneously connecting said piston with said source of power and closing said gate, and for opening said gate when said piston is disconnected from said source of power.

12. The combination of the starching box having vertical sides, the piston fitted to and working therein and provided with indentations in its face, the piston rod, the over-balanced crank for operating said rod, and the springs between said rod and piston, substantially as described.

13. The combination of the starching box having vertical sides, the piston having depressions in its face fitted thereto, the plunger head, the elastic connection between said head and piston, the over-balanced crank connected with said plunger head, the continuous power, and means for throwing said crank shaft into and out of gear therewith, substantially as described.

14. In a starching machine, the combination of the rectangular, open-front starching box, the sliding gate for closing said front, the piston fitted to and working vertically in said box and provided with indentations in its face, and an elastic connection between said piston and its rod, substantially as described.

15. In a starching machine, the combination of the rectangular, open-front box adapted to receive the garment, the piston working in the box, means for conveying starch into said box and upon said garment, a vertically sliding gate for closing the front of said box, the roll journaled in fixed bearings at the bottom of said opening, the roll journaled in vertically movable bearings above said opening, and means for connecting said piston and rolls to a source of power to operate the same, substantially as described.

16. The combination of the open front box, the sliding gate for closing the same, the plunger working in said box, the overbalanced crank for operating said plunger, means for simultaneously closing said gate and throwing said crank into gear with a continuously running source of power, and means for automatically and simultaneously opening said gate and throwing said crank out of gear, substantially as described.

17. In a starching machine, the combination of the rectangular, open-front starching box, the indented piston working therein, the vertically sliding gate for closing the front of said box, the roll journaled in fixed bearings at the bottom of the opening, the roll journaled in vertically movable bearings at the top of said opening, the continuously running source of power, and means for throwing said rolls into gear with said source of power when closed together, and out of gear therewith when separated from each other, substantially as described.

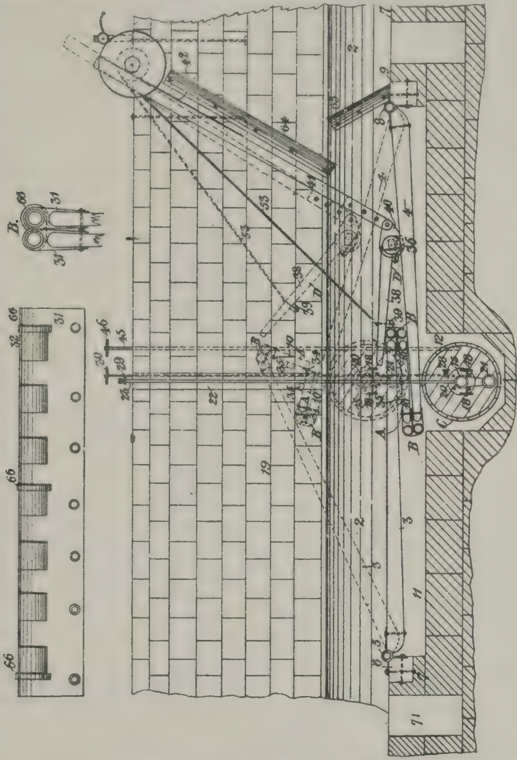
489,557. REVERSIBLE GATE FOR WATER-WAYS. George W. Dorrance, St. Paul, Minn. Filed Nov. 14, 1891. Serial No. 411,953. (No model.)

Claim.—1. In a device of the class described, the combination with the hinged wing, of the hollow cylinder or barrel arranged transversely of the way underneath the wing, but independent thereof, and means for admitting air and water to, and exhausting them from said cylinder, substantially as described.

2. The combination with the hinged wing, of the hollow cylinder arranged transversely underneath, but independent of said wing, guides directing the vertical movement of said cylinder, and air and

with said cylinder near its bottom and connected to a pump, substantially as described.

4. The combination with the waterway, of the duplicate wings hinged at the bottom of the way, an intermediate hinged member or flap, and double acting hinges connecting said flap with the tops of the wings, substantially as described.



5. The combination with the waterway, of the duplicate wings hinged at the bottom of the way, an intermediate folding flap connected to the tops of the wings by double acting hinges, and means for automatically raising said wings in dead water, substantially as described.

6. The combination with the waterway, of a submerged gate therefor, having duplicate hinged wings, an intermediate folding flap connected to the top of the wings by double acting hinges, and a guard wing hinged to one of said wings and projecting upward to protect said flap and hinges, substantially as described.

7. The combination with a submerged water gate, of a hollow cylinder or barrel arranged underneath and transversely thereof, means for admitting air or water to said barrel, and vertical guides therefor, substantially as described.

8. The combination with the submerged water gate having duplicate wings flexibly connected together by an intermediate folding flap, of a guard wing hinged upon one of said wings, and adapted to be turned upward on its hinges to serve as a fender for the connections at the top of said wings, substantially as described.

9. The combination with the submerged water gate, of means for hoisting the same in dead water, comprising in combination a barrel or hollow cylinder arranged transversely of the way underneath, but independent of, said gate, and means for filling the same at will with water or air, substantially as described.

10. The combination with the submerged water gate, of the hollow cylinder arranged transversely beneath the same, and having journal support at each end, vertical guides for said cylinder, a water pipe communicating with the bottom of the cylinder, and an air pipe connecting its top, substantially as described.

11. The combination with the submerged water gate, of the hollow cylinder arranged transversely beneath the same, vertically sliding journal supports for the ends of the barrel, and means for filling

ing with the cylinder near its bottom a pump
pipe for exhausting the water from said cylin
mitting water to said cylinder, substantially

13. The combination with the submerged
tunnel connecting with the water way on ea
outlet for said tunnel communicating with the
of the gate, and a three way gate or valve
with its outlet, substantially as described.

14. In a submerged water gate, the com
hinged transversely at the bottom of the wa
together at the top, of a guard wing hinged
and overlapping said flexible connection, c
guard wing at or near its top, winding dr
means for rotating said drums, substantially.

15. In a device of the class described, m
and supporting it against backwater, consist
or barrel arranged underneath, but indepen
for holding it in bearing contact with the ga
ing it at will with air or water, substantially

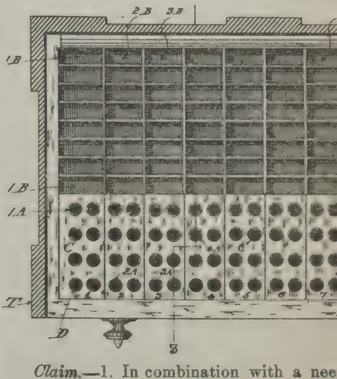
16. In a submerged watergate, the com
cate wings hinged at the bottom of the wa
flexibly connected together, of a guard wing
wings and projecting over said flexible conn
hinge of said guard wing, and upright bars c
and also so connected with the abutment wa
ward thrust of said bars caused by the rising
the guard wing upward, substantially as des

17. In a submerged water gate, the com
hinged at the bottom of the way and flexib
their top, of a guard wing hinged upon on
extending toward its top, cranks upon the h
upright rack bars connected to said cranks,
racks, drums connected to and rotated by
upon said drums connected to said guard wi
stantially as described.

18. In a water gate having a pair of hi
mediate flap, the double acting hinges conne
spective tops of said wings, comprising in co
bers or webs, and the intermediate solid w
stantially as described.

19. In a water gate the combination wi
at the bottom of the way and the interme
acting hinges connecting said flap with the
comprising in combination the pair of simila
and the intermediate solid web turning upon
as described.

489,558. DRAWER FOR SEWING-M
BER B. ESSINGTON, St. Louis, Mo. Filed Jan. 2
(No model.)



Claim.—1. In combination with a nee
several sections, of partitions in one sectio
compartments, needle wells in the other s
for said wells, substantially as and for the p

2. In combination with a needle drawe
tions, of partitions in one section dividing

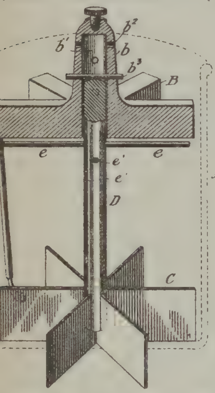
the bottom of said wells, substantially as and ed.

with a needle well-block, of removable glass thereof, and extending above the surface of ttom for said wells, substantially as, and for

the reception of sewing-machine needles, the r stop, consisting in the combination of a shoulne upper edge of the rear end of the side parts ing shoulder formed in the casing adapted to the drawer to prevent the withdrawal of the n a horizontal position, and the lower roundedends of the side parts of the drawer, adapting drawer to be raised vertically, when partly , enabling the drawer to be entirely withdrawn ntially as described and for the purposes speci-

---

VANIC BATTERY. GEORGE L. FOOTE, Brooklyn, , 1892. Serial No. 445,774. (No model.)



mbination of a battery electrode in the form ether and resting on edge, a second electrode or cavity and a post provided with slots or ed to fit over said plates and its other end id socket or cavity, substantially as described.

attery, the combination of an electrode and a ne from below, the electrode provided with a ne post projects and means for adjusting the t shall project into said chamber for the pur-

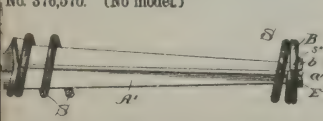
tery, the combination of a rotatable zinc elecscraping device arranged below the same for

n with the stationary post carrying the scraprode pivoted on the post above the scraping

attery, the combination of two electrodes and the electrodes being arranged one above the de being supported by the post and the lower position by the post, substantially as described.

attery, the combination of two electrodes and the extremities of the post being mechanically tive electrodes, for the purpose set forth.

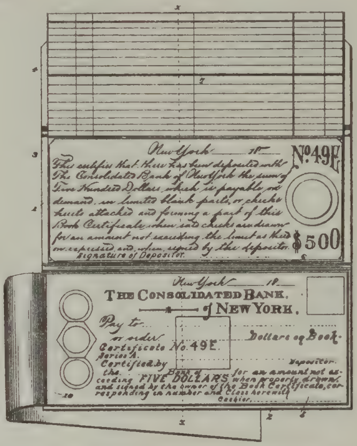
DLE. FREDERICK W. HOEFER, Freeport, Ill. Filed No. 376,570. (No model.)



ination with the handle shank having the lonng at its inner end the circumferential shoulder e and at its outer end a button with a corre-

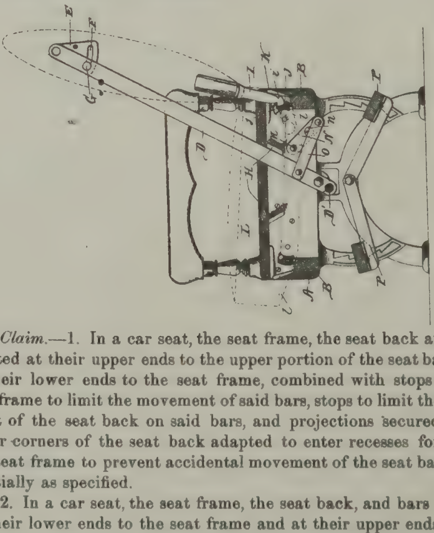
fied amount indicated thereon, the sum total of said checks when drawn for their full limit values being equal to the amount of the deposit, substantially as described.

2. A bank check-book, comprising a certificate of deposit, a number of blank certified checks, each good for a specified amount indicated thereon, the sum total of said checks when drawn for their full limit values being equal to the amount of the deposit, and an agreement between the issuing party and the depositor, substantially as described.


New York ____ 18__
No. 49E
This certifies that there has been deposited with The Consolidated Bank of New York the sum of Five Hundred Dollars which is payable on demand, in limited blank parts, or checks hereto attached and forming a part of this Book Certificate when said checks are drawn for an amount not exceeding the limit as therein expressed and when signed by the depositor.
Signature of Depositor.
$500
New York ____ 18__
THE CONSOLIDATED BANK.
of NEW YORK.
Pay to
or order
Dollars of Book.
Certificate No. 49E.
Series A.
Certified by the Bank of for an amount not exceeding FIVE DOLLARS when properly drawn and signed by the owner of the Book Certificate, corresponding in number and Class herewith
Depositor.
Cashier.
x
3
2
7
10
x
2

3. A bank check-book, comprising a certificate of deposit, a number of blank certified checks, each good for a specified amount indicated thereon, the sum total of said checks when drawn for their full limit values being equal to the amount of the deposit, an agreement between the issuing party and the depositor, and a description of the depositor, substantially as described.

489,562. CAR-SEAT. JOHN S. JOHNSTON, Chicago, Ill., assignor to the Adams & Westlake Company, same place. Filed Mar. 28, 1892. Serial No. 426,691. (No model.)

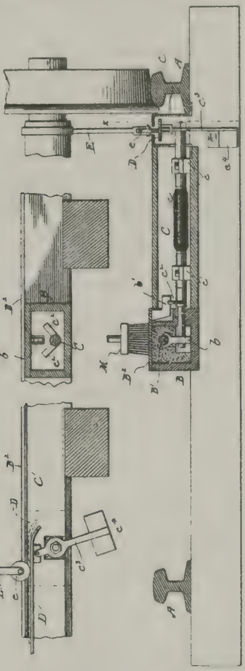


Claim.—1. In a car seat, the seat frame, the seat back and bars pivoted at their upper ends to the upper portion of the seat back and at their lower ends to the seat frame, combined with stops on the seat frame to limit the movement of said bars, stops to limit the movement of the seat back on said bars, and projections secured to the lower corners of the seat back adapted to enter recesses formed in the seat frame to prevent accidental movement of the seat back, substantially as specified.

2. In a car seat, the seat frame, the seat back, and bars pivoted at their lower ends to the seat frame and at their upper ends to the upper portion of the seat back, combined with a beveled seat-bottom supported on the seat frame, arms N pivoted on the seat frame and connected at one end to the seat bottom, links O connecting the other ends of the arms N to the bars, and stops on the seat frame to limit the movement of the said bars, substantially as specified.

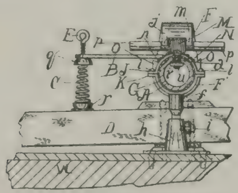
a device carried by the vehicles for turning the crank on the rock shaft for the purpose set forth.

2. In an electric railway, the combination of the main and sectional conductors, a series of rock shafts and switches between the main and sectional conductors operated by the rock shafts, cranks on the ends of the rock shafts, the cranks on the successive pairs of rock shafts being joined by a bar pivoted thereto and a device carried by the vehicles co-operating with the bar to close said switches.



3. In an electric railway the combination of a plurality of rock shafts controlling circuit makers and breakers, a weighted cross-head on each rock shaft, bars, as D, pivotally connected respectively with the successive pairs of cross-heads, a device carried by the vehicles arranged to move said bar thereby rocking the shafts and operating the circuit makers and breakers.

489,564. KEY-TOUCH ADJUSTER FOR PIANOFORTES. Frank B. Long, Los Angeles, Cal. Filed May 26, 1892. Serial No. 434,483. (No model.)



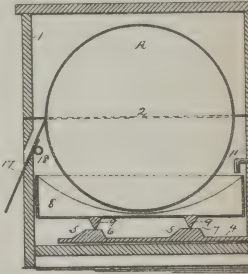
Claim.—1. A touch adjuster for piano fortes comprising the combination set forth of a journaled key-spring-carrying rod; a series of key-spring-carrying arms secured thereto by suitable means and arranged to project therefrom over their respective keys; a series of springs arranged respectively to communicate between the arms and their respective keys; and the spring-carrying screws arranged to screw through the arms respectively and connected with the springs immediately or by suitable intermediate means to move the springs toward or from the keys to increase or decrease the pressure of the springs upon their respective keys, and means for partially rotating the rod.

2. In a touch adjuster for piano fortes the combination set forth of the journaled rod consisting of the tube provided on one side with the slot arranged longitudinal of the tube; the spring-carrying arms

over their respective keys and the springs c
the arms and their keys.

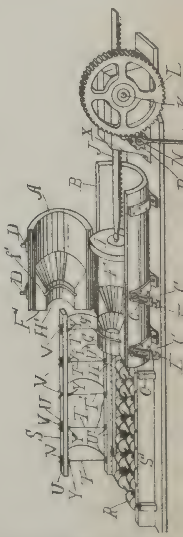
4. In a touch adjuster for piano fortes th
of the journaled spring-arm-carrying rod pro
arm; the end bracket F comprising the uppe
and the lower journal box member K secure
with the worm retaining bracket *j*; the wor
arranged to mesh in the toothed arm.

489,565. ICE-CREAM FREEZER. J
burg, Pa. Filed Mar. 18, 1892. Serial No.

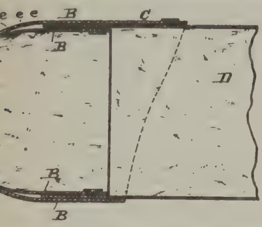


Claim.—In a device for freezing liquids
volving freezing cylinder and a feed pan ther
neath said pan for supporting the same adap
on a line parallel with the length of said fe
so arranged thereon with reference to thei
the pan will be raised and lowered accordin
backward and forward, a feed valve for r
pan and a rod connecting said valve and mo
valve is opened and closed by the same mo
raises and lowers the feed pan as set forth a

489,566. BUTTER-MOLD. William
son, Los Angeles, Cal. Filed Oct. 20, 1891.
model.)

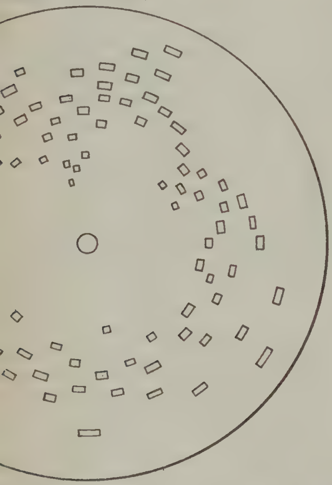


Claim.—1. A butter molding machine
tion set forth of the longitudinally divided c
ing the top and base members of the cylind
funnel shaped tubular discharge thimble o
to end fitted into the chamber of the cyli
base members of the cylinder at the discha
and means adapted to prevent the displacem
the thimble is in place in the cylinder and t
of the cylinder are secured together in thei



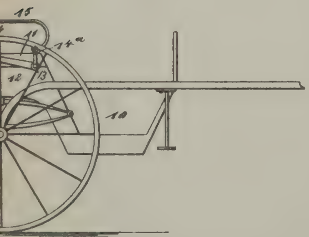
rticle of manufacture a coat sleeve protector nd an outer flap one of said flaps terminating sp the wrist the two flaps being attached to f the elastic band and the outer flap having he point of attachment of the inner and outer nd for the purposes described.

ORATED SHEET OR PLATE FOR MUSICAL IN- XANDER PETERSON, Berlin, Germany. Filed June 436,635. (No model.)



le of manufacture a perforated strip or plate said strip or plate being made of celluloid.

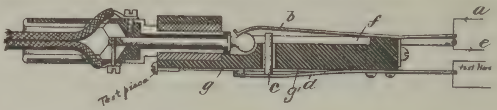
LE-SEAT. JACOB RUCH, Mount Eaton, Ohio. Filed l No. 425,301. (No model.)



nbination with a stationary seat, of the adsts, 20, which are pivoted to both said seat r adjusting the back, as shown and described, be adjusted forward or back without mateto the seat, as specified.

, with the seat and the seat back hinged nounted on the under side of the seat, arms the rod and secured to the seat back, a lever l, and a fastening device to fix the position of s described.

489,570. SPRING-JACK SWITCH. CHARLES E. SCRIBNER, Chicago, Ill., assignor to the Western Electric Company, same place. Filed Dec. 27, 1880. Renewed Feb. 24, 1890. Serial No. 341,402. (No model.)

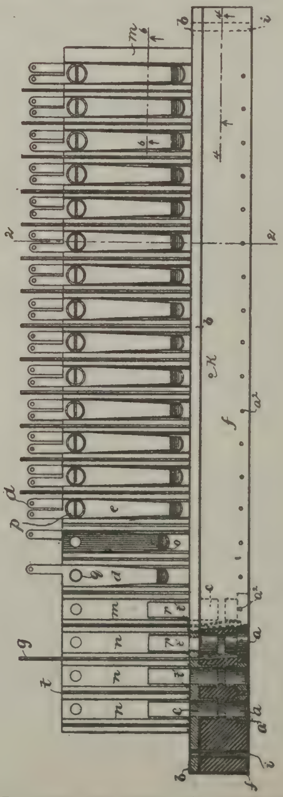


Claim.—1. The combination with a spring jack switch of a loop plug inserted therein, the main lever of said switch being lifted by said plug from its normal contact point, a spring carrying said contact point which closes upon a test piece of the switch when the main spring is lifted and the insulated ring or terminal which is closed to the other point of the loop plug, whereby the two line terminals of the switch are connected with different points of the plug and the test piece of the switch connected with the normal contact point of the main spring or lever, substantially as shown and described.

2. The combination in a spring jack switch of the main spring *b* and the contact *c* carried upon an auxiliary spring *d* having less force than the main spring and the test piece *g* accessible at the front of the spring jack with which test piece the spring *d* is adapted to close when the main spring is lifted, substantially as and for the purpose specified.

3. In a spring jack switch, the combination with the main spring or lever, of a yielding contact or connection against which said spring is adjusted to normally press, and a stop for limiting the movement of said yielding contact toward said spring, substantially as and for the purpose specified.

489,571. SPRING-JACK SWITCH FOR TELEPHONE-EXCHANGES. CHARLES E. SCRIBNER and WILLIAM R. PATTERSON, Chicago, Ill., assignors to the Western Electric Company, same place. Filed Jan. 21, 1892. Serial No. 418,827. (No model.)



Claim.—1. In a spring jack switch, the combination with the test springs when the plug is inserted, substantially as and for the purpose specified.

2. In a spring jack switch, a pair of springs or contact pieces insulated from one another by a strip of rubber or other insulating material, said material extending throughout such lengths of the springs as are straight lines and adapted to flex when the springs are flexed, whereby said contact springs are insulated from one another and adapted to move together when flexed, substantially as described.

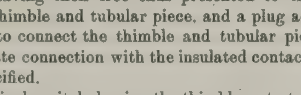
3. In a strip of spring jack switches, the combination, with the rubber front provided with test thimbles having extensions, of the combs carrying the pairs of contact springs of the switches, and provided with slots for the extensions from the test thimbles and an intermediate bar provided with tubular extensions, one tubular extension corresponding to each test thimble, substantially as specified.

4. In a spring jack switch, a test thimble provided with an oblique terminal extension, and a tubular portion, said thimble and tubular portion being insulated from one another, in combination with contact springs having their free ends presented to the plug hole formed by said thimble and tubular piece, and a plug adapted to be inserted therein to connect the thimble and tubular piece together and make separate connection with the insulated contact pieces, substantially as specified.

5. A spring jack switch, having the thimble or test piece thereof provided with a rearwardly projecting extension, in combination with a tubular portion corresponding in position to the said thimble, said tubular portion being connected with ground and provided with a perforation larger than the terminal extension from the thimble through which said extension piece passes, whereby the insulation of the thimble or test piece is secured, substantially as specified.

6. In a strip of spring jacks, the combination with a strip of insulating material, of test thimbles inserted in perforations therein and provided with shoulders adapted to rest against the bottoms of counter-sunk portions of said perforations, and a metallic bar having cylindrical extensions projecting into the same perforations from the opposite side of the strip, substantially as described.

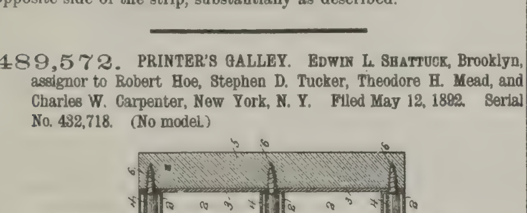
489,572. PRINTER'S GALLEY. EDWIN L. SHATTUCK, Brooklyn, assignor to Robert Hoe, Stephen D. Tucker, Theodore H. Mead, and Charles W. Carpenter, New York, N. Y. Filed May 12, 1892. Serial No. 432,718. (No model.)



Claim.—1. A printer's galley composed of a metal base plate and tubular metal rails united by screws the heads of which bear upon the inner surface of the lower plate of the said rails, substantially as described.

2. A printer's galley composed of a metal base plate and tubular metal rails united by screws the heads of which bear upon the inner surface of the lower plate of said rails and fill the openings in the upper plate of said rails through which they are entered, substantially as described.

489,573. CONDUCTOR SYSTEM FOR ELECTRIC RAILWAYS. GEORG W. VON SIEMENS, Berlin, Germany, assignor to Siemens & Halske, same place. Filed Feb. 3, 1892. Serial No. 420,222. (No model.)



Claim.—1. In an electric railway, the combination with a contact conductor composed of a series of relatively insulated sections, a supply conductor, normally interrupted connections between the supply and contact conductors, an electro-magnetic device for each contact section, and armatures adapted to be successively operated by a magnetic device on the vehicle, to close the circuit through said magnetic devices, to complete the interrupted supply connection of

device on the car to operate the circuit closin and release the lock of the preceding section.

3. In an electric railway, the combinati ductor composed of a series of relatively ins supply conductor, normally interrupted conne ply and contact conductors, a device for ea magnets having spring retracted circuit clo tures, and a series of armatures m', &c., adapt electro-magnetic device on the car to operate net of one section, and the retracting magnet of the adjoining section, substantially as desc

4. In a system of electrical distribution f nation of a continuous main insulated condu conductor composed of a series of sections other, a series of electro-magnetically contro cally connecting and disconnecting the said m respective sections of the sectional conducto circuits including the magnets of said cont trolled contacts for making and breaking sa magnet traveling with the car adapted to oper shunt circuits in the manner and for the purp

5. In a system of electrical distribution f nation of a continuous main insulated condu conductor composed of a series of sections i other, a series of electro-magnetically control cally connecting and disconnecting the said m respective sections of the sectional conducto circuits including the magnets of said cont trolled contacts for making and breaking s armatures for retaining the contacts of said magnets for releasing said lock armatures, an shunt circuits including said releasing magnet tacts of the first shunt circuits in the order closure of circuit through one of the sectio ductor is released simultaneously with the cl a succeeding section.

489,574. PROCESS OF OBTAINING PHIDE OF NICKEL. ROBERT M. THOMPSON June 20, 1892. Serial No. 437,364. (No spe

Claim.—1. The hereinbefore described crude nickel for use in the production of ni in smelting ores, mattes or other bodies con "tops" rich in caustic alkalies, produced fro with alkaline sulphides or other re-agents pr kaline metals or ammonium in previous opera

2. The hereinbefore described method of ing crude nickel for use in the production of sisting in smelting the ores, or mattes contai centrated alkali, produced by allowing the "t smelting of crude nickel with sulphides of al nium in previous operations to decompose then separating the insoluble portions, and phide so formed to settle and separating the s

489,575. PROCESS OF OBTAINING PHIDE OF NICKEL. ROBERT M. THOMPSON June 20, 1892. Serial No. 437,365. (No spe

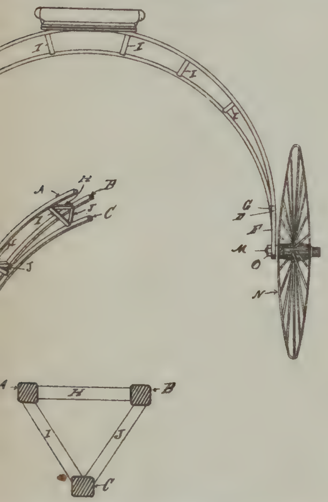
Claim.—1. The hereinbefore described m separating sulphide of nickel, consisting in s or other bodies containing nickel with a suita stantially as set forth, whereby the nickel is c tallic nickel, in allowing the crude nickel to gravity, in separating the same after settli niter or salt cake substantially as set forth, w whereby the niter or salt cake is decompose formed, which unites with the crude nickel t and in allowing the nickel sulphide to settle gravity and in separating the same after sett

2. The hereinbefore described method o soda for use in producing nickel sulphide fro ing in smelting the crude nickel with comm cake with an excess of carbon, whereby the

ESS OF OBTAINING AND SEPARATING SUL-
Robert M. Thompson, New York, N. Y. Filed
al No. 437,366. (No specimens.)
reinbefore described method of producing a
metal or ammonium for use in processes for
ng sulphide of nickel from crude nickel con-
rude nickel in a suitable furnace with "tops"
alkaline metal or ammonium resultant from
the sulphide of nickel in other similar opera-

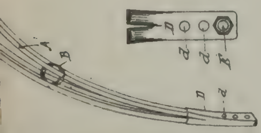
e described method of producing and separat-
onsisting in smelting the ores, or mattes con-
able re-agents substantially as described, and
nickel so formed to settle, in separating the
y convenient manner and in smelting the same
h tops rich in a sulphide of an alkaline metal
from the final separations of the sulphide of
ar operations, and in allowing the sulphide of
le and in separating the same after cooling.

ICLE-AXLE. **James W. Vaughn**, Greenville, Pa.
Serial No. 443,129. (No model.)



cle axle, consisting substantially of three semi-
ons, two of which are on the same horizontal
ntrally below them, the ends of which are se-
l sections, adapted to receive and support re-
, and the central portion thereof by means of
and for the purpose set forth.
n in a vehicle axle, of a central arched portion
B, and C, secured together centrally by braces
ns F, secured to the ends of said central arched
spindles, adapted to be adjusted up and down
ubstantially as and for the purpose set forth.

Y-AXLE. **James W. Vaughn**, Greenville, Pa. Filed
l No. 450,397. (No model.)

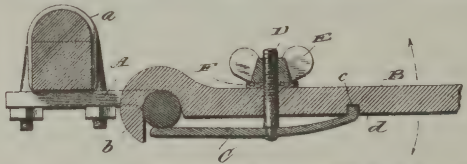


mbination in a sulky axle, of four or more
aces securing said arched sections together so
a tubular arch, substantially as and for the

n a sulky axle, of four or more arched sec-

sections together, and removable wheel spindles, secured in said end sections, substantially as and for the purpose set forth.

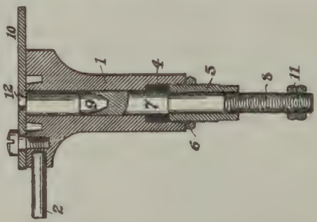
489,579. POLE OR THILL COUPLING. **Phillip Weidner**, Saylor Springs, Ill. Filed Aug. 16, 1892. Serial No. 443,211. (No model.)



Claim.—1. The combination with the upper plate with hook at one end, and a hole in its under side of the plate having a lug at one end to engage the hole in the hooked plate, and a bolt rising from between its ends through a hole in the upper plate, and a thumb nut on the upper end of the said bolt, as and for the purpose specified.

2. The combination with the hooked plate having a hole in its under face, of a plate swiveled on the said plate and provided with a lug at one end to enter said hole and a bolt projecting upward from the under plate between its ends and passing through a hole in the upper plate, and a thumb nut on the upper end of the bolt above the upper plate, the hook of the upper plate extending below the lower face of the lower plate, substantially as and for the purpose specified.

489,580. BULLET-MOLD. **John H. Barlow**, New Haven, Conn. Filed May 12, 1892. Serial No. 432,928. (No model.)



Claim.—1. The mold body having the opening therethrough, the sleeve screw-threaded axially of the lower end of said opening, and the shoulder plunger having its upper end conformed to the shape of the point of the ball, and filling the opening and having its lower end passing loosely through the sleeve, the whole arranged substantially as specified.

2. In a bullet mold of the character described, the combination with the body having a vertical opening extending through the same, said opening adapted to fix the diameter of the ball, of a vertically movable plunger having its upper extremity conformed to the shape of the tip of the ball to be cast and provided with a shoulder, and a sleeve connected to the body and adjustable therein, the plunger adapted to have a sliding movement within said sleeve, substantially as described.

3. In a bullet mold of the character described, the combination with the body having the opening extending through the same, of the plunger having a shoulder thereon and seated in the opening, a sleeve engaging the plunger beneath the shoulder and adapted to limit its downward movement and a screw-threaded connection between the sleeve and body whereby the former is rendered adjustable within the latter and thereby the capacity of the mold varied, substantially as and for the purpose set forth.

489,581. INTERLOCKING SWITCH AND SIGNAL. **Christian A. Christofferson**, Indianapolis, Ind. Filed June 23, 1892. Serial No. 437,740. (No model.)

versely of the catches and bearing a cam or cams adapted to shift the positions of said catches, and an engagement between the cam shaft and the switch levers.

2. The combination, in an interlocking signal apparatus, of a single signal lever carrying the catch-bar, two or more catches connected to the signal chains ropes or wires, and adapted to alternately engage with said catch bar, and mechanism by which the engagement and disengagement of said parts is effected, said mechanism consisting of fixed supports whereby said catches are thrown toward said latch by gravity, and a locking cam positioned between them whereby the force of gravity is overcome and first one and then the other of said catches thrown out of said engagement.

3. The combination, in an interlocking signal apparatus, of the signal lever, the chains ropes or wires running to the signal apparatus, a connection between said lever and said chains, ropes or wires, consisting of a vertically movable latch-bar and vertically arranged catches adapted to engage over a head or into notches on said latch-bar, and supports for said catches when disengaged.

4. The combination, in an interlocking signal apparatus, with catches arranged vertically in a housing and provided with side extensions or wings, of rests or supports in said housing below said wings adapted to support said catches and cause them to incline inwardly by the force of their own gravity.

5. The combination, in an interlocking signal apparatus, of the housing D, a catch-bar moving vertically in said housing, a stop to limit its downward movement, two or more catches adapted to alternately engage therewith, and a cam located between said catches, whereby one or the other, but not both, are thrown and held out of engagement with said latch bar.

6. The combination, in an interlocking signal apparatus, of the switch lever, connections to the signals which are attachable and detachable to and from said lever, a rock-shaft having a cam by which the detachment is effected, arms on said rock-shaft, and fingers mounted on the rods connected to the switch levers and extending behind the arms on the rock shaft, and adapted as said rods are pulled to come in contact with said arms and thereby operate said rock shaft.

7. The combination, in an interlocking signal apparatus, of switch levers, rods running therefrom to the switches, projecting fingers thereon, a signal lever, two or more connections running thereto from signals at a distant point which are adapted to be alternatively engaged therewith, means of engagement consisting of catches which are automatically forced into engagement, and a cam on a rock-shaft adapted to be operated by the fingers on the switch rods to effect such disengagement.

8. The combination, of the switch levers B and B′, rods running therefrom to the switches, and provided with fingers, the signal lever C, the vertically moving latch bar C′, a housing D within which said latch bar is situated, catches F′ and G′ also within said housing arranged to engage with said latch bar, a cam mounted on a rock-shaft and situated between said catches, a weighted arm on said rock shaft whereby it is normally held in position, and other arms thereon with which the fingers on the switch rods will engage, whereby its position will be changed as the switches are opened, and a different one of the catches brought into engagement with the latch bar, thus making ready for the display of a different signal.

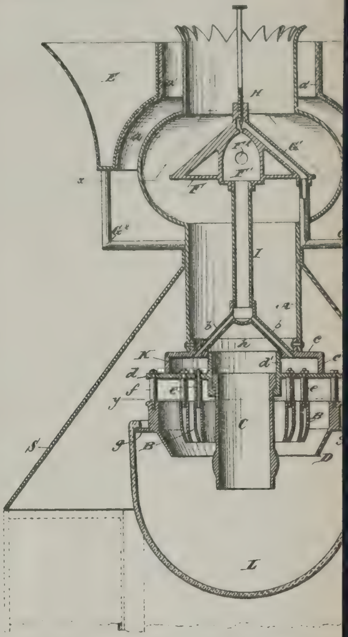
9. The combination with the catches of an interlocking signal apparatus, of a cam mounted on a rock shaft and situated between said catches, a weighted arm on said shaft for holding said cam in one position, whereby one of said catches will engage with the latch bar, and other arms which engage with fingers or projections on the switch rods, whereby the position may be reversed.

489,582. REGENERATIVE LAMP. ANDREW J. ENGLISH, Cincinnati, Ohio. Filed Apr. 19, 1889. Renewed June 9, 1892. Serial No. 436,088. (No model.)

Claim.—1. In a regenerative lamp of the character described, the combination with the inverted burner, and an uptake chimney, of a vaporizing retort located within the chimney above the burner, and having an air inlet opening, and a hydrocarbon reservoir communicating with said retort, substantially as described.

2. In a regenerative lamp, the combination of an annular inverted burner, a refractory deflector located within the burner, an uptake chimney, a vaporizing retort located in said chimney above

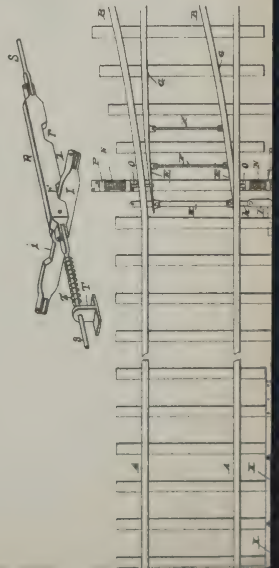
the character described, of the annular reserv tort, G′, supply pipe, G, and their immediate supply pipe, I, and connected parts constitutin stantially as set forth.



5. The combination with the annular b flector C projecting downward within the chamber K from which the burner is suspend ney communicating with the cylindrical defle surrounding the upper part of the chimney, the chimney and provided with retort G′ ga H, the pipe G connecting the reservoir and re necting the gas chambers F″ and K, substant

---

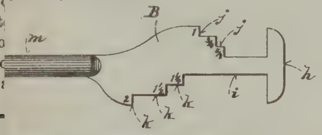
489,583. AUTOMATIC SAFETY RAI C. O. GRUHLKE, Morris, Ill. Filed July 6, 1892 model.)



matic switch, the combination, with mechan- tch, of a notched slide-bar, a locking-bar for the slide-bar to hold the switch open, a rod g-bar, springs for pulling the locking-bar into otch in the slide-bar, a crank-lever, a link con- to the rod, contact-bars pivoted at their inner , guides, guide-bars sliding in the guides and he outer ends of the contact-bars, and springs substantially as described and for the purpose

---

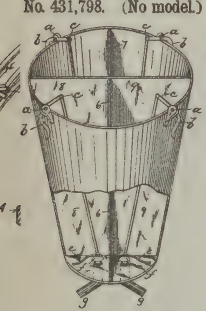
BER-GAGE. **FRANK O. HAVENER**, Rockport, Me., o William E. Douglass, Rome, Ohio. Filed Sept. 5, 5,068. (No model.)



er-gage comprising a plate having a T-head ated shoulders running diagonally in opposite d a socket at the opposite end of said plate ncil or handle.

ving the T-head, *h*, shank, *i*, and diagonally , in combination with the socket, *m*, secured ; the interiorly-threaded mouth, and the pencil rranged to operate substantially as described.

NEL. **THOMAS W. JOHNSON**, Boston, Mass. Filed No. 431,798. (No model.)



nation of a funnel, divided into compartments, bottom, with tubes running from the bottom, rs attached thereto, said rods extending up- partments, jointed at their upper ends and e same; substantially as described.

INE FOR CUTTING, POINTING, AND SHAPING JOHNSON, Richmond, Va., assignor to the Tredegar Filed July 12, 1892. Serial No. 439,818. (No

nbination, substantially as hereinbefore set ointing bit mounted thereon, a reciprocating ed by and reciprocating with the cross head, thereon, a housing, pressure rollers mounted he reciprocating bar, a shear block mounted shear block mounted on the cross head.

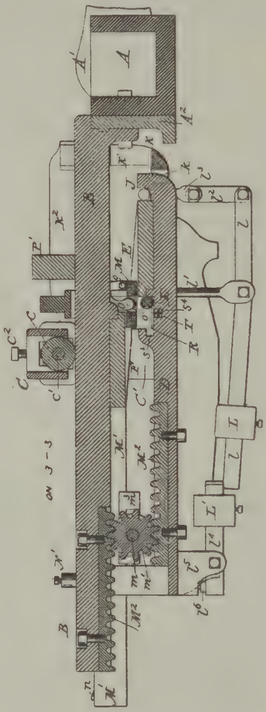
, substantially as hereinbefore set forth, of a cating pointing bit, and arms or levers for sition between the bits.

, substantially as hereinbefore set forth, of a ting bit carried thereby, a bed plate, a point- , lifting arms secured to the bed plate, and procating bar for operating the lifting arms.

, substantially as hereinbefore set forth, of a ating bit carried thereby, a bed plate, a point- brackets for supporting a rod to be operated

reciprocating bar, a pointing bit carried thereby, a bed plate, a pointing bit mounted thereon, pivoted lifting arms mounted on the bed plate, and lugs carried by the lifting arms and engaging lugs carried by the reciprocating bar.

7. The combination, substantially as hereinbefore set forth, of the bed plate, a pointing bit mounted thereon, a reciprocating bar, a pointing bit carried thereby, a carrier means for operating it, and devices for feeding the bar operated upon to the carrier.



8. The combination, substantially as hereinbefore set forth, of a bed plate, a pointing bit mounted thereon, a reciprocating bar, a pointing bit carried thereby, a carrier, and connections between the carrier and the reciprocating bar for reciprocating the carrier.

9. The combination, substantially as hereinbefore set forth, of the bed plate, a pointing bit mounted thereon, a reciprocating bar, a pointing bit carried thereby, a reciprocating carrier, racks carried by the bed plate and the reciprocating bar, and pinions gearing with said racks, and connected with the carrier.

10. The combination, substantially as hereinbefore set forth, with the stationary and the reciprocating pointing bits, of a reciprocating carrier, devices for discharging the pins from the carrier, and means for operating the discharging devices.

11. The combination, substantially as hereinbefore set forth, with the stationary and the reciprocating pointing and severing bits, of a transversely moving sweep for discharging the pins from the machine.

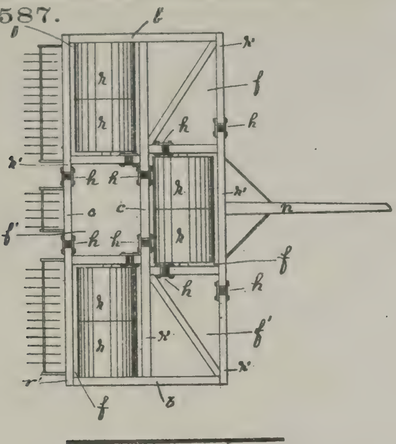
12. The combination, substantially as hereinbefore set forth, of the bed plate, a pointing bit mounted thereon, a reciprocating bar, a pointing bit carried thereby, a carrier, means for reciprocating it, a sweep moving in a transverse channel of the bed plate, and means for operating the sweep.

13. The combination, substantially as hereinbefore set forth, with the stationary and reciprocating pointing and severing bits, a reciprocating carrier, discharging knuckles, the weighted levers acting thereon, the transversely moving sweep.

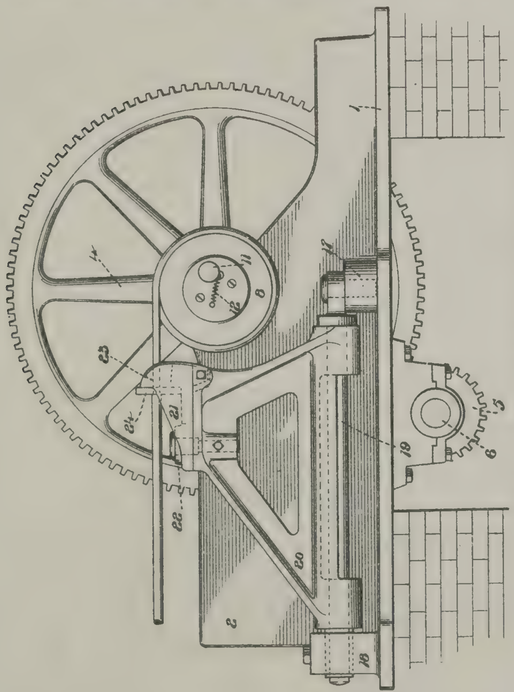
489,587. LAND-ROLLER. **ENOCH KIME**, Milton, Ohio. Filed Sept. 17, 1892. Serial No. 446,180. (No model.)

Claim.—In land rollers, the land roller formed by the combina-

489,587.



489,588. WIRE-DRAWING MACHINE. GEORGE B. LAMB, Waterbury, Conn. Filed June 22, 1892. Serial No. 437,568. (No model.)



Claim.—1. In a machine for drawing wire, a wire block both revolubly supported and having a peripheral recess formed in a line spiral to the axis of said block, and a drawing-in chain having a suitable vise said vise secured to the block and adapted to be contained within said recess, in combination with a drawing die and a rocking support for the same, substantially as specified.

2. In a wire-drawing machine, the combination with a revolubly supported wire block, of a die-carrying rocker, mounted upon the base with its axis at right angles to and below the plane of the wire block, and in line with the die opening said rocker extending upward in front of the wire block, and a die-holder mounted upon the top of said rocker, substantially as and for the purpose set forth.

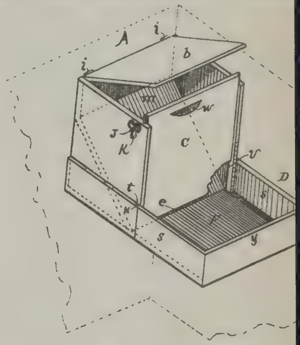
3. In a wire drawing machine, a revoluble wire block provided with a gripping device for drawing-in and holding the wire, in combination with a shaft mounted on the bed below the wire block and extending parallel to the lead of the wire, a laterally swinging rocker mounted on said shaft, and a die holder secured upon and carried by

top of the rocker, the whole arranged and a
stantially as specified.

5. In a wire-drawing machine, the combi
wire block having means for holding and dr
rocker having its axis below the plane of the
angles to the axis of the latter and in line wi
and having its upper end extending upward to
of the block said rocker provided at its top w
ing a die, the whole arranged substantially as
die as carried by the rocker may have a tra
with the winding surface of the block, as and f

6. In a wire-drawing machine, and in c
able rotative wire block, the pivotally mount
as described, the die holder pivotally secure
rocker, and adjustable stops interposed betwee
whereby the movement of the latter on its
and varied, substantially as specified.

489,589. FEED-TROUGH. THOMAS LEW
Feb. 19, 1892. Serial No. 422,126. (No mod



Claim.—1. A feed bin having vertical si
vertically adjustable a bolt J arranged to pas
bin a nut *k* on the bolt to impinge the wall a
in an adjustable position, a feed box hinged t
at the bottom of the bin, and a hinged cove
forth.

2. The herein described feed-bin consist
and back and an inclined bottom, a feed bo
by hinges, a retaining spring secured to the
bin, a button to hold the feed box in a horiz
able front to the feed bin and means for hol
a hinged cover for the feed bin substantially

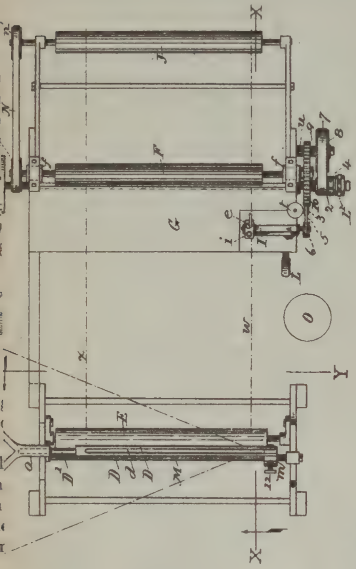
489,590. MACHINE FOR DOUBLING
TUDINALLY AND STITCHING THE EDGE
WIN H. MARBLE, and FRED. H. GREENE, Wo
20, 1892. Serial No. 443,635. (No model.)

Brief.—The cloth is folded longitudinal
wardly over a triangular frame or table A
through a doubler-guide formed of two inclin
being laterally adjustable to accommodate
The folded cloth is passed under guide-roll E
F F, and just before passing between rolls F
together by sewing mechanism I. The dr
tinuously, and the operating parts of the mac
with by means of a clutch 4.

Claim.—1. In combination, substantial
wardly inclined triangular frame or table, th
intervening space *d*, extending obliquely do
said frame, and laterally adjustable in rel
draft, the guiding roll E beneath said guid
G, the pair of draft-rolls across the rear of sa
ing mechanism arranged on said support-ta
rolls, the driving-shaft K, and operating b
motion is imparted from said shaft simulta
and sewing mechanism, for the purposes set

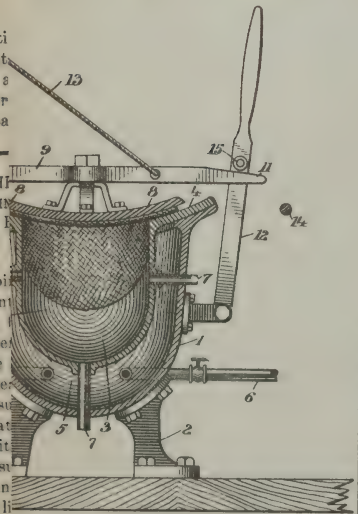
2. In combination, substantially as d

sewing mechanism, substantially as and for the



r doubling and attaching selvages of fabrics, ntially as described, of the guide-holder socket s D having at one end the stud 12 telescoping ring-slide fixed to the other ends of said guide- hereon said bearing-slide is mounted and a for securing the same at positions of adjust- d for the purpose set forth.

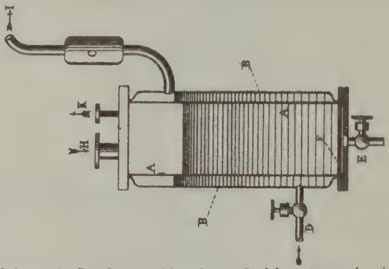
BRIM-PRESSING MACHINE. JAMES MARSHALL, led Oct. 25, 1890. Serial No. 369,277. (No model.)



im pressing machine, comprising the follow- r casing 1 flanged at its upper end as shown, al area than the interior of the vessel 1 and h rests upon the flange of vessel 1, said pot

manner as to form the steam space 5 between the adjacent walls as shown, the steam-pipes 6 in communication with said chamber, in combination with the pressure plate 8 pivotally connected to the lever 9 fulcrumed at one end between ears upon the vessel or pot 2, a cord and weight to keep said plate normally elevated, and an operating lever 12 to apply pressure to the lever 9 which controls the movement of the plate 8, all constructed and arranged substantially as and for the purpose set forth.

489,592. PROCESS OF PURIFYING CHLOROFORM. RAOUL P. PICTET, Berlin, Germany. Filed May 13, 1892. Serial No. 432,922. (No specimens.) Patented in France Sept. 4, 1891, No. 215,911.

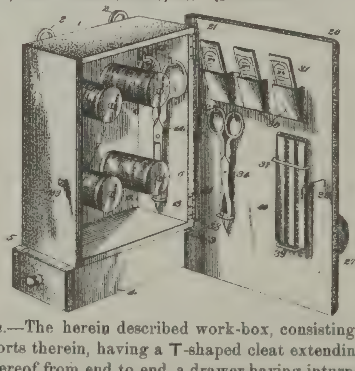


Claim.—1. In the purification of chloroform the improvement which consists in cooling ordinary commercial chloroform to about—80° to—82° centigrade, and removing by filtration the solid bodies thereby formed, substantially as described.

2. The process of purifying chloroform, which consists in cooling the chloroform to about—80° to—82° centigrade, filtering, crystallizing the chloroform, and eliminating the non-crystallizable part, substantially as described.

3. The process of purifying ordinary commercial chloroform which consists in solidifying the foreign bodies crystallizable before the temperature reaches—80° and in filtering the cold liquid mass, crystallizing the chloroform itself and eliminating from it the final non-crystallizable part which contains the impurities, and finally distilling the chloroform thus obtained at a very low temperature and collecting the middle products, substantially as described.

489,593. WORK-BOX. ELWOOD T. RAMER, Geneseo, Ill. Filed May 19, 1892. Serial No. 433,608. (No model.)

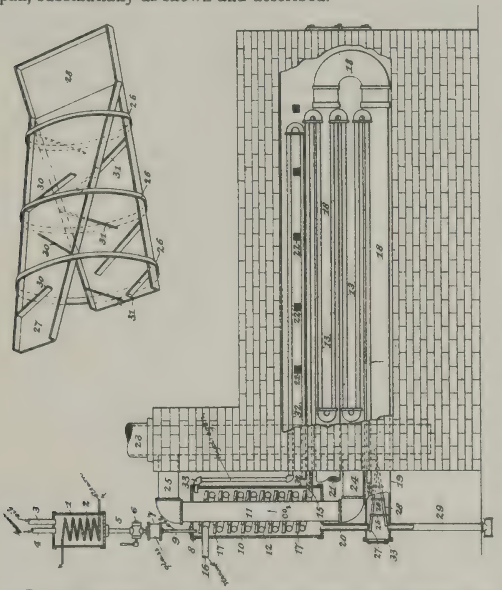


Claim.—The herein described work-box, consisting of a body, with supports therein, having a T-shaped cleat extending across the bottom thereof from end to end, a drawer having inturned edges engaging the edges of said cleat and adapted to open from one end of the body, a projection on one side of the body, and a cover hinged to the other side of said body and provided with interior and exterior supports, and a spring catch adapted to engage the projection on said body, said cover being longer than the body and closing over and hiding said drawer on the front side, substantially as described.

489,594. APPARATUS FOR PRODUCING GAS. JAMES S. ROGERS and JAMES H. BAKER, Saratoga Springs, N. Y. Filed Mar. 17, 1892. Serial No. 425,232. (No model.)

Claim.—1. In an apparatus for producing gas from hydrocarbons and vapor exit pipes communicating therewith, a steam coil arranged therein, and a pan or plates also coiled in said chamber and following the convolutions of the steam coil, the arrangement of the pan and steam coil being such that the steam coil does not come in contact with the hydrocarbon as it flows through the pan, substantially as shown and described.

3. In an apparatus for producing gas from hydrocarbons, a vaporizer provided with an outer and an inner tube or casing, having an annular chamber between said tubes or casings, and hydrocarbon and vapor supply and exit pipes communicating therewith, a steam-coil within said chamber, a coiled pan or flanged plates, arranged in proximity to said coil and means for directing the hot products of combustion from the retort furnace through the inner tube or casing, the arrangement of the pan and steam coil being such that the steam coil does not come in contact with the hydrocarbon as it flows through the pan, substantially as shown and described.



4. In an apparatus for producing gas from hydrocarbons, the combination with a retort furnace, of a vaporizer, provided with an oil supply, a retort in communication therewith, and a removable secondary, or auxiliary vaporizer within one end of the retort, or an extension thereof, substantially as shown and described.

5. In an apparatus for producing gas from hydrocarbons, the combination with a retort furnace of a vaporizer, provided with an oil supply, a retort one end of which is in communication with the bottom of the vaporizer, and a secondary or auxiliary vaporizer within the end of the retort, into, or upon which, the hydrocarbon from the vaporizer which is not vaporized is dropped, substantially as shown and described.

6. In an apparatus for producing gas from hydrocarbons, the combination with a furnace, of a retort provided with an extension as 19, a vaporizer having an oil supply, the bottom of the vaporizer being in communication with the top of said extension, a waste pipe communicating with the bottom of said extension, and a secondary or auxiliary vaporizer within said extension and forming a connection or communication between the opening which leads to the vaporizer and that of the waste pipe, substantially as shown and described.

7. In an apparatus for producing gas from hydrocarbons, the combination, with a furnace, of a vaporizer having an oil supply, a retort in communication therewith provided with an auxiliary vaporizer consisting of inclined pans or plates, as 27, and 28, one of which is adapted to receive the unvaporized hydrocarbon from the vaporizer and the outer to convey the same to a waste pipe communicating with the retort, substantially as shown and described.

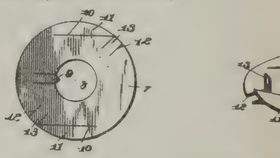
8. In an apparatus for producing gas from hydrocarbons, the combination with a furnace, of a retort, a vaporizer in communication therewith and provided with an oil supply, a waste pipe opening, or pipe, also in communication with the retort, and an auxiliary, or

communication with the vaporizer and the o
with a waste pipe, and a secondary or auxiliar
a communication or connection between said
as shown and described.

10. The combination with a furnace, of
porizer in communication therewith and prov
of the secondary vaporizer located within th
thereof, consisting of the flanged plates 27 a
inclined ribs or vanes 30 and 31, substantially

11. In an apparatus for producing gas
combination of a vaporizer, of a retort furnac
in in communication with the vaporizer and
drogen or its equivalents with the vapor of the
vaporizer, consisting of a pipe or pipes which
the furnace and communicate with the va
shown and described.

489,595. NUT-LOCK. WILLIAM SUTTON
of one-fourth to Robert McIlvoy, same place.
rial No 431,289. (No model.)



Claim.—The combination with the fish
tion at its bolt receiving-opening, and the b
opening having a groove along its threaded
indentation, of the washer having a bolt rece
of which is provided with a downwardly and i
engaging the indentation of the fish plate and
said washer being further provided at opposi
wardly bent wings for embracing the nut an
each wing, with tongues upwardly bent at a r
and the nut, and a nut one of the corners of
gage the tongue, substantially as specified.

489,596. CAST-OFF FOR SUSPENDER-
New Britain, Conn., assignor to the Traut &
pany, same place. Filed Nov. 19, 1892. Serial

Claim.—1. In a suspender end cast-off, t
body provided with a loop or equivalent mea
suspender end, and having the centrally arra
of the hook having the shank working in sai
for holding the hook elevated, the end of the
in proximity to or in contact with the body
whereby the opening to the hook is closed; s

2. In a suspender end cast off the combin
tion having the guide way therein and the
lip, of the hook having the shank working i
catch for holding the hook elevated with th
the body bridging the opening of the hook; s

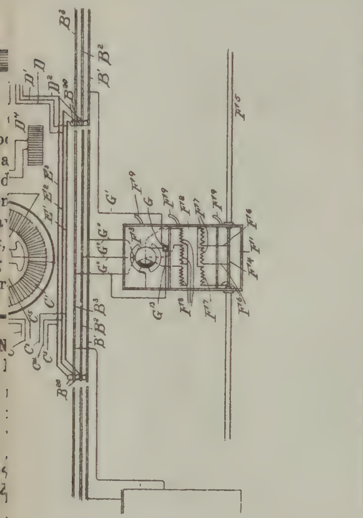
3. In a cast off for suspender ends, the co
portion having the guide way therein, and
extension or lip provided with a recess, of th
working in the guide way and the catch pro
operating with the recess in the lip or exte
stantially as described.

4. In a suspender end cast off, the com
having the guide way therein and lip provid
hook having the shank journaled in the guid
carried by the shank and the catch projectio
co-operating with the recess in the lip for h
vated position; substantially as described.

489,597. MULTIPHASE RAILWAY S
Chicago, Ill. Filed Feb. 19, 1892. Serial N

on the approach of the car, said device includ-
ently connecting successive groups of rail sec-
permanent connection between them, and a
e car.

ailway system the combination of exposed con-
groups of sections and adapted to be brought
ing motor with insulated main conductors, a
connected with such mains, a series of con-
rimary coils permanently in the main circuit
ving part circuits terminating at each end in
part circuits normally open, a device to close
ch of the car, and fore and aft trolleys adapted
ps of sections to operate said device and fur-
the motor of the car, and a multiphase motor



ilway system the combination of exposed con-
groups of sections adapted to be brought into
motor with insulated main conductors and a
h having a primary coil permanently in the
dary coil having a part circuit terminating at
d rail, said circuit normally open, a device to
pproach of the car and fore and aft trolleys
ent groups of sections to furnish between them
such device associated with one set of trolleys.

ilway system the combination of exposed con-
groups of sections and adapted to be brought
ing motor with insulated main conductors, a
nnected with such mains, and a series of con-
ries of primary coils permanently in the main
econdary coils having part circuits terminat-
exposed rail, said part circuits normally open,
me on the approach of the car and fore and
en on different groups of sections to furnish
tes the device associated with one of the sets
ices including each a conductor permanently
ive groups of rail sections, and a multiphase
rent, and a multiphase motor on the car.

ailway system the combination of insulated
hose primary coils are permanently in circuit
ional conductors arranged in groups with
car is adapted to be connected, a local part
are the rail sections of a given group and a
terminals are the rail sections in successive
local circuits normally broken and contain-
dary coil, the latter of said local circuits per-
id successive groups, and means connected
the former responsive to a current delivered
ltiphase generator to supply current, and a
e car.

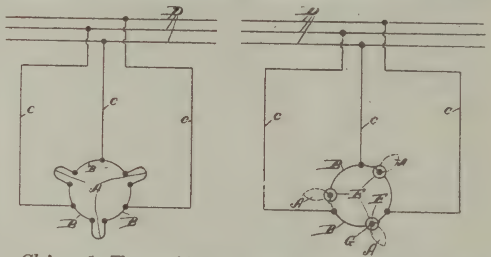
current delivered from the car, and a multiphase generator to supply current, and a multiphase motor on the car.

7. The combination of a movable car with means for leading from an insulated conductor a multiphase current thereto, a multiphase motor transformer on such car, a storage device to receive from such motor transformer and a switch to control connections from the insulated cable to the car, said switch responsive to a current delivered from such storage device.

8. In an electric railway system the combination of exposed conductor rails in groups of sections and adapted to be brought into circuit with a moving motor, with insulated main conductors, connections from such main conductors to the rails of each group of sections, a multiphase generator to supply current to such system and a multiphase motor on the car to be actuated by such current.

9. In an electric railway system the combination of exposed conductor rails in groups of sections and adapted to be brought into circuit with a moving motor, with insulated main conductors connections from such main conductors to the rails of each group of sections, a multiphase generator to supply current to such system and a multiphase motor on the car to be actuated by such current, said connections from the rails to the main conductors normally open with a switch interposed and provided with a series of contacts, said switch controlled from the car.

489,598. ELECTRIC-LIGHTING SYSTEM. FRANCIS B. BADT, Chicago, Ill. Filed Oct. 22, 1892. Serial No. 449,896. (No model.)



Claim.—1. The combination of the conductors of a multiphase system with a group of incandescent lamps, the filaments of which are connected in series and conductors leading each from one main line conductor to a point in the series circuit between a pair of lamps.

2. The combination of the conductors of a multiphase system with local conductors leading one from each main conductor, and a series of lamp sockets, conductors connecting one terminal of each socket with the opposite terminal of the other, such conductor connected with the local conductor and a series of incandescent lamps to be inserted in such sockets.

3. The combination of a group of lamps with a supporting rosette, the filaments of said lamps connected in series and having a local conductor leading from a point between each pair of lamps, a fixed base, a series of main line conductors, a local conductor from each main line conductor to a terminal on the fixed base and connecting devices whereby when the rosette and base are brought together each main line conductor is connected with the series conductor at a point between adjacent lamps.

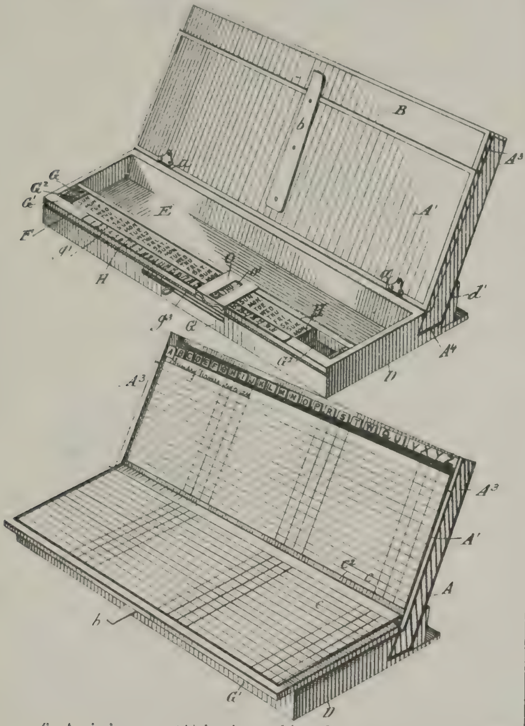
489,599. COMBINATION INDEX DEVICE. SIDNEY F. BAKER, Santa Barbara, Cal. Filed Feb. 18, 1892. Serial No. 421,949. (No model.)

Claim.—1. The within described combination reference index, consisting of a set of double faced, flexible jointed leaves, inserted in a pocket (A^5) of and in combination with an index case (A), standing upon a base (D) in a socket (d') in combination therewith essentially as shown and described.

2. In combination with a base having a longitudinal recess and a case adapted to be supported therein, said case carrying a series of leaves or pages which are provided on one edge with a flexible strip to which is secured a strip of similar material to the page or leaf, the opposite side or edge of the sheet having a tab secured thereto, substantially as shown, whereby said leaf may be retained and turned in the case, for the purpose set forth.

3. In combination with a base having a longitudinal recess, a case

a case adapted to be maintained in an inclined position thereon, said case having a lid which is adapted when opened to lie over the flat portion of the base and provide a flat surface upon which the leaves of the index may rest, said leaves being adapted to be retained within the case and provided with flexible extensions on the lower edge thereof, substantially as shown.



6. An index case (A) having a hinged face lid (A') with finger strap (*b*), back (A^2), ends (A^3,) bottom (A^4) and pocket (A^5,) all as especially described.

7. An index case having a removable depending portion at its front upper end to which a ruler is secured and a hinged cover for the case, the parts being organized substantially as shown, and for the purpose set forth.

8. A rectangular index case (A), having pocket (A^5) in combination with the index leaves of two parts flexibly joined. The margin or lower part being secured in the pocket (A^5) substantially as described.

9. A rectangular base (D) having socket (*d*) and back piece (*d'*), tray (E) and calendar (F), all substantially as described.

10. In an index case, the combination of a base having an upwardly projecting back piece and a raised portion in front of the same, the upwardly projecting parts being of different heights, of a case adapted to be supported between the raised portions of the base, substantially as shown.

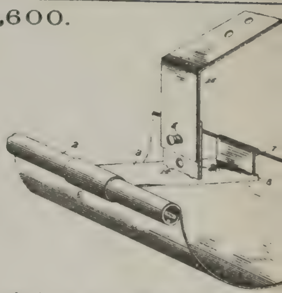
11. A rectangular base (D), having socket (*d*), tray (E), and calendar (F), composed of block (H), sliding in dovetail ways in the base, said block (H) having the days of the week printed thereon and on the base a scale of numbers corresponding to the number of days in the month, substantially as described.

12. The base (D) having the calendar (F) composed of the block (H) sliding in ways in said base, said block having printed thereon the days of the week, the side (G') provided with a scale of numbers corresponding to the number of days of the month, and a slide having a sight aperture adapted to be moved over the block (H) and side (G') for keeping dates, all substantially as described.

489,600. EAVES-TROUGH HANGER. Lewis S. Bonbrake, Waynesburg, Ohio. Filed May 18, 1892. Serial No. 433,434. (No model.)

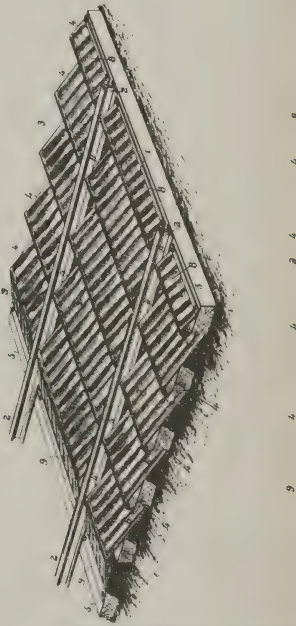
Claim.—1. The combination with an eaves trough having a bead

489,600.



to engage the bead and with a depending lu
moving inward and provided at its rear end v
the rear side of the eaves trough, and having to
base of the loop and passing through the back
venting the disengagement of the loop, and a ver
the cross-bar and provided with means for adj
to be secured to a roof strap or the like, substa

489,601. CATTLE-GUARD. John J. Cal
Horn, Stevens' Point, Wis. Filed Oct. 19, 189
(No model.)

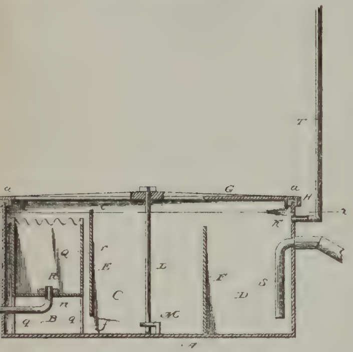


Claim.—1. A cattle guard section extending
track and consisting of a single sheet of metal
series of vertical portions and a series of incline
tical portions being secured to similar faces of t
clined portions each extending upward from the
the top and across the adjacent tie, substantially

2. A cattle guard section extending longitudi
consisting of a single sheet of metal and compose
tical portions and a series of inclined portions, an
portions connecting the upper ends of the vertic
tions and presenting a broad smooth surface to
mals, substantially as described.

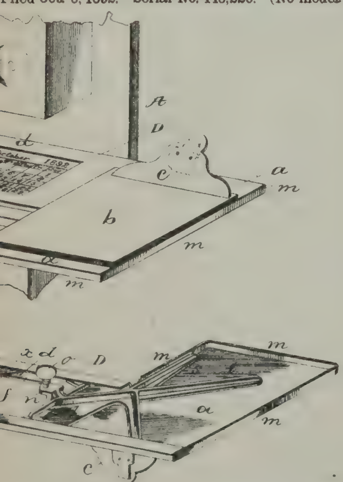
3. A cattle guard section constructed of a si
and consisting of a series of inclined portions p
tudinal corrugations, a series of vertical portion
cured to similar faces of cross-ties, and a series
connecting the upper ends of the inclined and ve
stantially as described

th another of the compartments, substantially
set forth.
n of a blow off basin divided by integral trans-
eries of communicating compartments, a steam
one of the compartments, a boiler, a pipe hav-
to the boiler and its other end terminating
ator, a vapor pipe communicating with one of
he basin and connections between one of said
asin and a sewer, substantially as described.



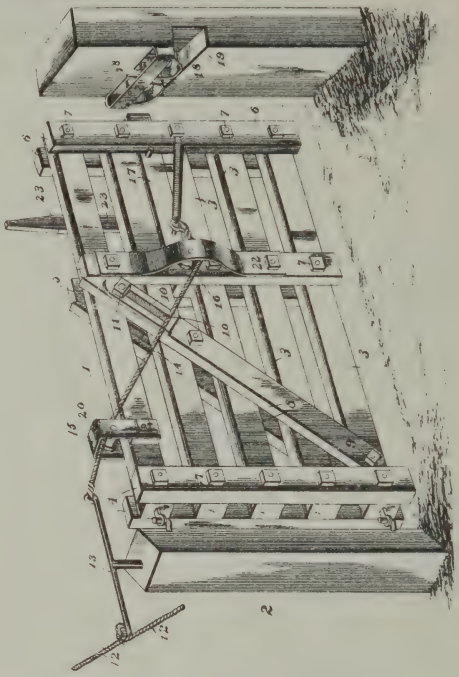
n of a blow off basin, the interior of which is
f communicating apartments or chambers, a
ged in one of the compartments or chambers
edges notched or corrugated, a boiler, a pipe
to the steam separator, a vapor pipe commu-
he compartments near the upper end thereof,
on between one of the compartments and a
described.
sin consisting of the interiorly divided shell
d with a boiler and a sewer, a top cap or cover
nding parallel flanges between which the upper
s of the basin fit, packing arranged between
e flanges on the cover, and a single central
said cover with the floor or bottom of the
described.

ACHMENT FOR TELEPHONES. **JAMES L. DAVID-**
Filed Oct. 8, 1892. Serial No. 448,220. (No model.)



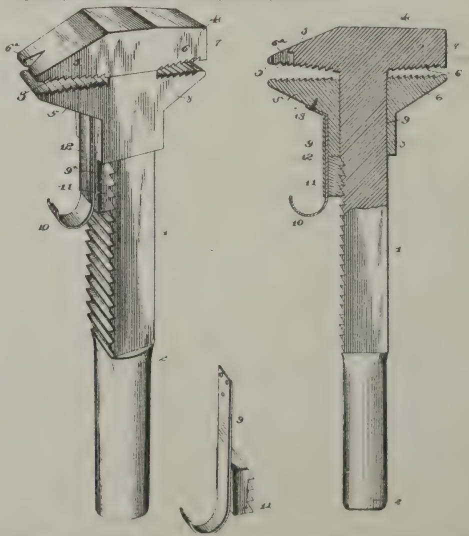
achment for telephones consisting of a sheet
a tablet-support at one end, a support for a cal-
elow the surface of the structure at the oppo-
displaying the calendar, and means for secur-
a telephone box.
t for telephones, consisting of a sheet metal
let-support thereon and provided with an ex-

489,604. GATE. **THOMAS E. FOUDRAY**, Sedalia, Mo. Filed Mar. 17, 1892. Serial No. 425,288. (No model.)



Claim.—The combination of a hinge post, a gate hinged to the same and provided on its top with a pulley and having a pulley mounted on one of its sides, a spring actuated latch bar mounted on the gate, a lever fulcrumed on the top of the hinge post, a latch rope passing around said pulleys and having one end attached to the latch bar and its other end connected to the lever, and operating ropes connected with the lever, substantially as described.

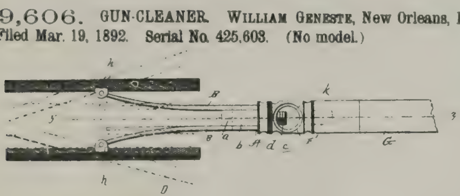
489,605. WRENCH. **SANFORD GASSER**, Trout Creek, Mich. Filed Apr. 23, 1892. Serial No. 430,398. (No model.)



Claim.—1. In a wrench of the class described, the combination with the rectangular stock, terminating at its lower end in a handle, and at its upper end in a head forming a jaw, of a sliding head

2. In a wrench, the combination with the rectangular stock provided with a series of teeth on its outer face, at its lower end provided with a handle and at its upper end with a transverse head forming front and rear jaws, slightly diverged from the stock, the front jaw being provided with outwardly-disposed transverse cleats, the rear jaw with inwardly-disposed transverse cleats, the sliding head having a bore fitting the stock and provided at opposite sides of the same with jaws, the front one having inwardly disposed teeth and the rear one having outwardly-disposed teeth, the spring-metal strip secured to the front face of the sliding head, extending below the head and bent to form a finger-hold, the block 11 secured to the inner side of the same and having a ratchet face, and the flat spring secured to the front face of the head and having its lower free end resting on the outer face of the metal strip, substantially as specified.

489,606. GUN-CLEANER. WILLIAM GENESTE, New Orleans, La. Filed Mar. 19, 1892. Serial No. 425,608. (No model.)



Claim.—1. In a gun cleaner, the combination with a stock or head; of two forked springs secured to said head, and friction plates pivoted at or about mid-way of their length to the forked ends of the springs, substantially as specified.

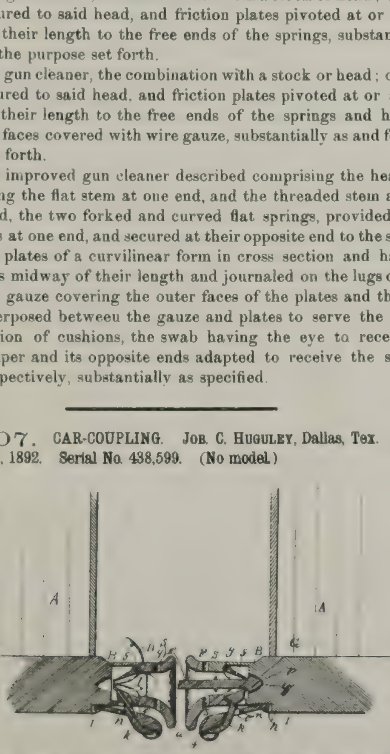
2. In a gun cleaner the combination with a stock or head; of two forked flat springs secured at one end to said head and curved outwardly in opposite directions and terminating in lug journals or gudgeons, and two friction plates having lug eyes in their longitudinal edges about midway of their length and journaled on the forked ends of said spring substantially as specified.

3. In a gun cleaner, the combination with a stock or head; of two springs secured to said head, and friction plates pivoted at or about midway of their length to the free ends of the springs, substantially as and for the purpose set forth.

4. In a gun cleaner, the combination with a stock or head; of two springs secured to said head, and friction plates pivoted at or about midway of their length to the free ends of the springs and having their outer faces covered with wire gauze, substantially as and for the purpose set forth.

5. The improved gun cleaner described comprising the head or stock, having the flat stem at one end, and the threaded stem at the opposite end, the two forked and curved flat springs, provided with lug journals at one end, and secured at their opposite end to the stock, the friction plates of a curvilinear form in cross section and having the lug eyes midway of their length and journaled on the lugs of the springs, the gauze covering the outer faces of the plates and the absorbent interposed between the gauze and plates to serve the additional function of cushions, the swab having the eye to receive a patch or wiper and its opposite ends adapted to receive the stock, and rod respectively, substantially as specified.

489,607. CAR-COUPLING. JOB. C. HUGULEY, Dallas, Tex. Filed June 30, 1892. Serial No. 438,599. (No model.)



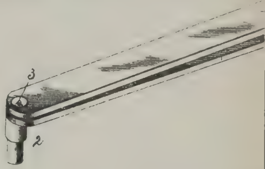
Claim.—1. The combination with a coupling pin having an enlarged conical head, of a draw head interiorly recessed and provided with means for engaging and releasing said head, pivoted jaws mutually recessed to correspond to the shape of the coupling pin head

mouth converging into an interior recess, of a
suitably placed in said recess, a co-operating lo
arranged in said recess in operative relation to
vided with a depending curved finger extending
of the draw-head a weighted detent lever ind
pivoted jaw and having an opening to receive t
controlling the movement of the lower jaw, subs

3. The combination with a draw head pro
an upper pivoted jaw and a pivoted lower jaw a
relation to the said upper jaw and provided with
ing finger, of a weighted detent lever engaged b
trolling the action of said lower jaw through th
gaging finger, and means for operating the jaw, s
fied.

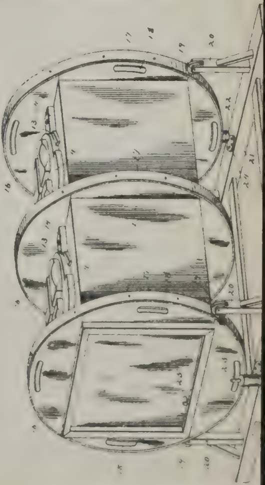
4. The combination with an upper pivoted
and a pivoted lower jaw co-operating therewith,
mechanically connected to said lower jaw, a cam
connected to said lower jaw and controlling th
against the influence of the retracting lever, a
for said cam lever restricting the drop of the
stantially as specified.

489,608. RIVETING-TOOL. BRUCE F. KL
assignor of one-half to Smith & Boullemet, same
1892. Serial No. 443,276. (No model.)



Claim.—As an improved article of manufac
or device for use in connection with box loops, c
bars connected to each other, at one end leaving
space between the same, and said bars being n
at the open ends thereof and diverging therefro
contact when in engagement with the box loops,
being adapted to be inserted in the box loops an
on the uppermost portion of one end thereof, th
provided with an anvil post located on the under
thereof, substantially as described.

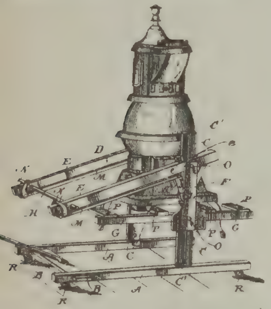
489,609. WASHING-MACHINE. SAMUEL B
Filed Sept. 14, 1892. Serial No. 445,879. (No m



Claim.—1. In a washing machine, the combi
vided at its ends with opposite horizontally dis
supporting rollers, a washing machine body hav
arranged upon the rollers and the vertically dis

ar track and mounted upon the rollers and
es, substantially as described.
achine, the combination of a base provided
ng rollers, vertical rolls arranged at the ends
body provided on its exterior with circular
diagonally disposed partitions arranged lon-
rs of the body and forming buckets and pro-
posed elongated discharge openings, and the
the sides and bottom of the body and extend-
een the partitions and supporting the same,
d.

ING DEVICE. JOHN W. LICKEY, Rushville, Ill.
Serial No. 446,217. (No model.)



ting device, the combination with uprights
series of teeth, of the operating levers pro-
penings to receive said uprights, spring-actu-
opposite sides of said openings to engage op-
on the uprights, and means to withdraw said
with the teeth, substantially as specified.
ce, the combination with oppositely toothed
ing levers provided with openings to receive
uated pawls to engage opposite series of teeth
bell-crank levers connected respectively to the
pairs, substantially as specified.
ce, the combination of the toothed uprights
inal slots, the operating levers provided with
uprights and having transverse guide pins ar-
to slide in the slots, the spring actuated pawls
levers, and means to retract said pawls simul-
as specified.
n of toothed uprights, operating levers slidably
ghts, and carrying spring-pressed pawls to en-
f, and horizontal supporting bars G slidably
ghts and connected to the levers by hangers,
d.
n with toothed uprights, operating levers slid-
n and carrying spring-pressed pawls to engage
ng-bars suspended by hangers from the oper-
pivoted to said supporting-bars and adapted
ge an article to be elevated, substantially as

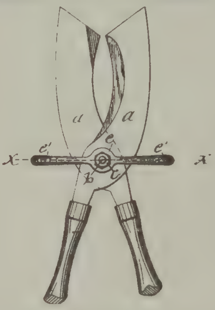
n with toothed uprights, and operating-levers
eupon, and carrying spring-pressed pawls of
bly mounted upon said uprights, and pivotally
, and hooks Q carried by said bars to engage
substantially as specified.
on of twin uprights provided with horizontal
rse slide fitted into openings in said base por-
rights may be laterally adjusted, and lifting
pon the uprights, substantially as specified.

K. WILLIAM MAC NEECE, Philadelphia, Pa. Filed
No 447,481. (No model.)

Claim.—1. The combination with the body and hinged lid of a desk of a guide secured to the side of the desk, a grooved fixture secured to and set in flush with the lid, and a lever one end of which is pivoted to the said grooved fixture at or near its outer end and which is adapted to be received by said grooved fixture when the lid is open, and the other end of which is bent over as shown and adapted to travel upon or in and to be held by said guide secured to the side of the desk, substantially as and for the purpose set forth.

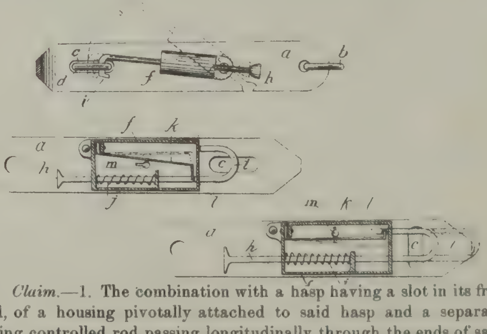
2. The combination with the body, hinged lid and slides of a desk of slotted guides secured to the side of the desk, grooved fixtures secured to and set in flush with the lid, levers the outer ends of which are pivoted to said grooved fixtures at or near their outer ends and which are adapted to be received by said grooved fixtures when the lid is open and the other ends of which are bent over as shown and which have a sliding connection with the said slotted guides upon the sides of the desk, arms, the forward ends of which are secured to and actuated by the inner ends of said levers and the rear ends of which are secured to the rear ends of said desk slides and slots in rear of said desk top through which the rear ends of said arms may play during their movements.

489,612. SHEARS. CHARLES C. NAGLEY, Memphis, N. Y. Filed Sept. 24, 1892. Serial No. 446,769. (No model.)



Claim.—The combination, with the blades —*a*—*a*—, bolt —*b*— and nut —*c*—, of a nut-lock consisting of two washers interposed respectively between the head of the bolt and adjacent blade, and between the nut and blade adjacent thereto, and a loop extending laterally from the washers and formed in one piece therewith and narrower than the washers to prevent clogging as set forth.

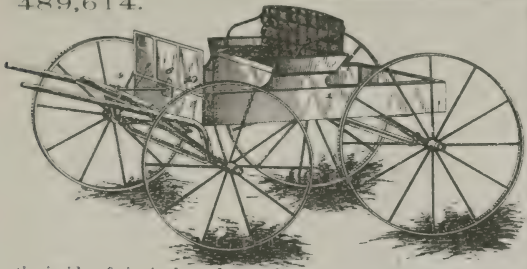
489,613. HASP-LOCK. DENNIS O'CONNOR, Biddeford, Me. Filed July 5, 1892. Serial No. 438,876. (No model.)



Claim.—1. The combination with a hasp having a slot in its free end, of a housing pivotally attached to said hasp and a separate spring controlled rod passing longitudinally through the ends of said housing and having on one end a hook adapted to engage a staple projecting through the slot in said hasp and on the other end a button or knob for operating the same, as and for the purposes set forth.

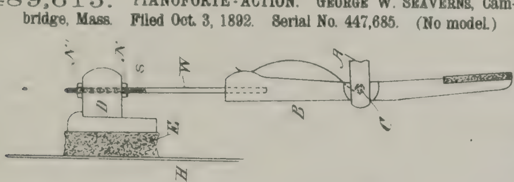
2. The combination with a hasp having a slot in its free end, a housing pivotally attached to said hasp, a spring controlled rod passing through said housing and having its end adapted to engage a staple projecting through said slot, of a recess made in said rod inside of said housing and a spring attached to the housing at one end and having its free end adapted to engage said recess, substantially

489,614.



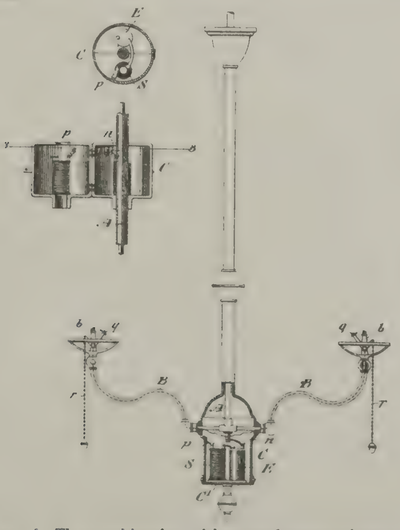
to the inside of the body and extending along the bottom and front thereof, a plate arranged on the outer face of the front of the body, a bolt passing through the front of the body and the brace and the plate and provided at its outer end with an eye, and a removable shank provided at each end with a hook removably engaging the eyes of the body and the shafts whereby the latter is held elevated, substantially as described.

489,615. PIANOFORTE-ACTION. **George W. Seaverns**, Cambridge, Mass. Filed Oct. 3, 1892. Serial No. 447,685. (No model.)



Claim.—In a piano forte action, the combination of the screw-threaded wire W, having two screw nuts N, N' adapted to adjustably hold the damper block D: with the damper block D, substantially as and for the purpose set forth.

489,616. ELECTRIC GAS-LIGHTING APPARATUS. **Aaron M. Sloss**, Kansas City, Mo. Filed Mar. 24, 1892. Serial No. 426,235. (No model.)



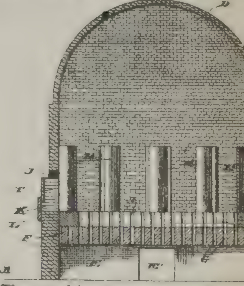
Claim.—1. The combination with a gas-fixture or lamp of a battery, a spark-coil, and a detachable case containing said battery and spark coil, formed in two parts and surrounding the main supply pipe of said fixture or lamp, substantially as set forth.

2. The combination with a gas-fixture or lamp, of a battery, a spark-coil, and a case containing said battery and spark-coil, which incloses the junction of the main supply-pipe with the branches supplying the several burners, substantially as set forth.

3. The combination with a gas-fixture or lamp, of a battery, a

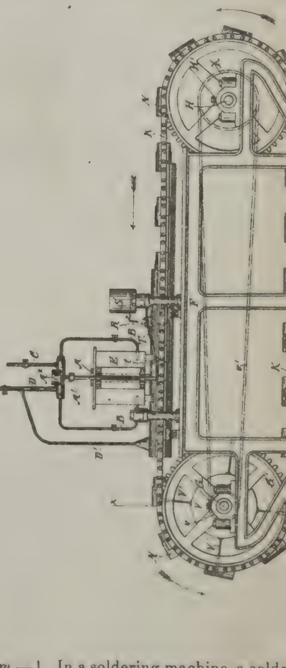
affixed to and surrounding the supply-pipe o
close said battery and spark-coil between sai
stantially as set forth.

489,617. BRICK-KILN. **Benny Swen**
Apr. 5, 1892. Serial No. 427,885. (No mode



Claim.—The combination in a down-dra
and the kiln body arranged over the base; o
fire-pockets or chambers arranged at the sid
said base, said fire-pockets or chambers being
perforate bottoms, imperforate inclosing side
bined fuel and draft openings at their upper e
the bottom of the live coal line being maintain
the upper outer edges of said combined fuel
the new coal being adapted to cover the live
therebetween and the top edges of said open
circulation from the outside directly through
ries of short vertical fire-flues secured to the
body and forming the inner inclosing walls
chambers, substantially as set forth.

489,618. SOLDERING-MACHINE. J
Switzerland. Filed Dec. 26, 1891. Serial N



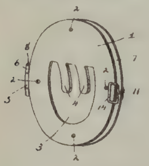
Claim.—1. In a soldering machine, a solde
inder having a solder delivery opening a and a
nel a^2 in the edge of the iron communicating w
wardly from said opening and being

tes P′ P² connected therewith for the purpose ar pieces N, which are to be soldered, and the)² between which and on the clutches O′ O² the carried, substantially as shown and described.

machine, the combination with the soldering ving an opening a, of the rod A′, the cross piece ted therewith, the supporting arms T T having lless chains I and K and the cylinders o' o^2 for e rod A′, substantially as and for the purposes

g machine, the combination with the endless chain wheels G′ and H′ and their shafts G and upon the axis G bearing a chain wheel v, the he axis H, an endless chain v' passing around wheels v and X, and the forked arms V′ upon the purpose specified.

RMENT-SUPPORTER. **Ellen Whalen**, Cumberland, 1892. Serial No 448,136. (No model.)

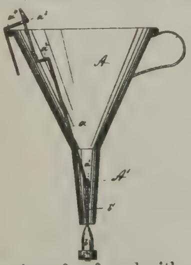


device of the character set forth, the combina- d plates connected at the side, one of which is e central portion of the same and the other pro- pending hooks extending forwardly and adapted oncavo-convex central portion of the other plate, ing said plates adjacent to each other, substan-

f the character set forth, the combination of a a opening in the center thereof with depending les to form hooks arranged parallel in a vertical from the upper wall of said opening, a covering- back-plate and having a concavo-convex central id hooks, and a clasp loosely attached to said aving a hook adapted to engage said back-plate aid plates adjacent to each other, substantially

---

EASURING-FUNNEL. **Lawrence J. Widness**, Brook- Sept. 17, 1892. Serial No. 446,153. (No model.)

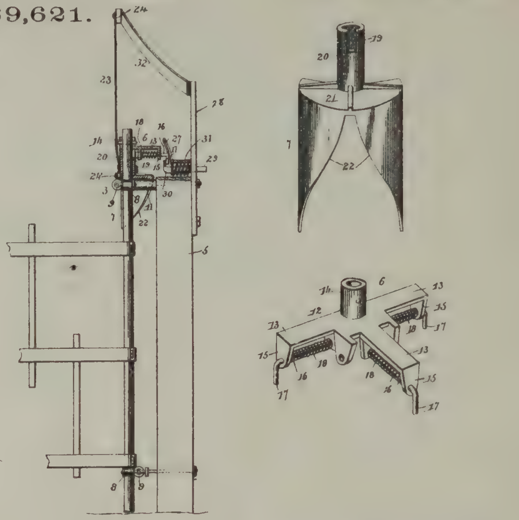


mbination of a funnel with a valve and with a asisting of a wire a which extends first sidewise upward to form an intertwisted handle a^3 and wnward to form hook a^4, substantially as specified.

TE. **William A. Williams**, New Harmony, Ind., as- to John T. Williams, same place. Filed Sept. 17, 1892. (No model.)

combination of a post, a gate hinged thereto, a the upper end of the post, a cam casting loosely er end of the gate and arranged to engage the o the gate and adapted to engage the cam cast- rigidly with the gate, operating levers, and a

489,621.



3. The combination of a post provided with eyes, a roller arranged on the upper eye, a gate having a pintle rod arranged in said eyes, a latch fixed on the pintle rod, a cam casting comprising a segment, a sleeve loosely mounted on the pintle rod and adapted to be engaged by the latch and depending cams arranged to engage the roller 11, and operating levers connected with the castings, substantially as described.

4. The combination of a post provided with eyes, a roller arranged at the upper eye, a gate having a pintle rod arranged in said eyes, a latch fixed on the pintle rod and having spring actuated bolts, a cam casting provided with a sleeve loosely mounted on the pintle rod and provided with a recess adapted to be engaged by the spring actuated bolts, said casting having oppositely disposed cams arranged to engage said roller, and operating rollers connected with the casting, substantially as described.

5. The combination of a post provided with eyes, a roller arranged at the upper eye, a swinging gate, a latch fixed to the pintle of the gate and comprising a T-shaped casting, and the spring actuated bolts mounted on the arms of the casting and arranged at right angles to one another, the cam casting arranged to engage said roller and provided with a sleeve loosely mounted on the pintle and having a recess to be engaged by the bolts, and operating levers connected with the castings, substantially as described.

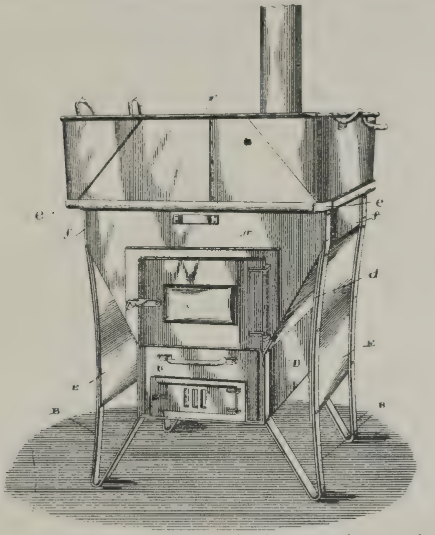
6. The combination of a post, a swinging gate hinged thereto and having a pintle rod, a roller arranged on the post near the upper end of the gate, a latch fixed to the pintle rod and provided with the spring actuated bolt arranged at right angles to one another, the cam casting having the sleeve loosely mounted on the pintle rod and provided with a recess adapted to be engaged by the bolt, and a releasing device having a spring actuated rod arranged to engage the catches or bolts of the latch to withdraw the same from engagement with the sleeve, substantially as described.

7. In a gate, the combination of the cam casting provided with a sleeve, a latch having spring actuated bolts adapted to engage the sleeve and having downwardly bent ends, and the releasing device comprising the divergent guide arms, the spring actuated bar having an upturned end, and a curved plate secured to the upturned end, substantially as and for the purpose described.

489,622. SUGAR-EVAPORATING PAN. **Chauncey C. Alfred**, Fairfax, Vt. Filed Mar. 14, 1892. Serial No. 424,843. (No model.)

Claim.—1. An evaporating arch having a fire box at its lower end, upwardly and outwardly inclined walls from the fire box upward, supports extending from the upper end of the arch down below the fire box and then upward and inward thereto, and depending plates secured to the supports and intersecting or joining the upper end of the said inclined walls, substantially as and for the purpose specified.

ing their upper ends extending along the said vertical walls and secured to the projecting ring, the supports extending below the fire box and upward and inward thereto, substantially as described.



4. An evaporating arch having a fire box at its lower end, outwardly and upwardly inclined walls projecting from the fire box, the upper end of the inclined walls bent vertically, supports extending downward from these vertical portions below the said fire box and upward and inward thereto, and depending plates secured to the inner sides of the said supports, their upper ends abutting against the lower edge of the vertical portions of the said walls, whereby a tight joint is formed and the lower ends extending to or below the fire box, substantially as specified.

489,623. YELLOW-RED DYE.

Fritz Bender and **Michael Kammerer**, Mühlheim-on-the-Main, Germany, assignors to A. Leonhardt & Co., same place. Filed Feb. 17, 1892. Serial No. 421,867. (Specimens.) Patented in England Jan. 21, 1892, No. 1,231, and in France Jan. 29, 1892, No. 219,023.

Claim.—1. The process of transforming the bluish red dyestuffs derived from dialkylmetaamidophenols, such as mentioned in the specification or their corresponding leuco-compounds, into other coloring matter of a more yellowish red tint, which consists in treating said compound by an oxidizing agent, such as potassium permanganate, and separating the color, substantially as described.

2. The yellowish red coloring matter derived from dialkylmetaamido phenols, which dissolves in water or spirit yielding scarlet solutions showing a brilliant greenish fluorescence, dissolving in sulphuric acid giving a yellowish solution which by diluting with water turns from orange into scarlet.

489,624. PROCESS OF PRECIPITATING OXIDE OF TIN FROM SOLUTIONS.

Camille L. C. Bertou, Paris, France. Filed Apr. 14, 1892. Serial No. 429,199. (No specimens.)

Claim.—The within described improvement in the process of precipitating tin in the form of an oxide from solutions containing it, consisting in first adding carbonate of lime to the solution while the latter is exposed to the air at a temperature nearly but below ebullition and gradually continuing such addition until the precipitation of the tin is completed, then allowing the liquor to cool and collecting the precipitate therefrom, next washing the precipitate with cold water and afterward suspending the washed precipitate in a solution of a carbonate of an alkali metal the strength of which is gradually increased until it presents a slightly alkaline reaction.

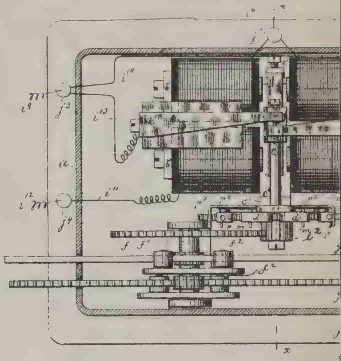
489,625. ELECTRICALLY-CONTROLLED VENTILATOR.

Sebastian G. Brinkman, New York, N. Y. Filed Mar. 3, 1892. Serial

ion f^2, revolved thereby and a rack engagin
to the valve, substantially as specified.

3. The combination of electro magnets b,
d, ratchet wheel c, engaged by the pawls, pi
ratchet wheels, a rack engaging the pinion,
the rack, substantially as specified.

4. The combination of an electro-motor
its circuit, a pinion revolved by the electro
tact with the thermostat switch, a valve h,
pinion for connecting the electro-motor with
as specified.



5. The combination of electro magnets b,
d, pivoted thereto, gear wheel e, pinion e^2, g
rack engaging such pinion and a valve en
stantially as specified.

6. The combination of electro magnets b,
ating pawls d, d, detents p, p, gear wheel e,
f^2, revolved by the gear wheel and with rac
tially as specified.

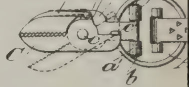
7. The combination of electro magnets b,
d, d, pivoted thereto, pins m, spring d' and
ing the pawls and with the pinion f^2, rack g,
as specified.

8. The combination of electro magnets b,
d, d, detents p, p, arms p^2, bent rod p^3, spri
wheel e, pinion f^2, rack g, and valve h, subs

9. The combination of electro-magnets b,
d, gear wheel e, pinion f^2, pivoted bearing
thereby and with valve h, engaged by the ra
fied.

489,626. CUFF-HOLDER.

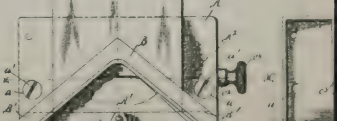
Esther
Filed Apr. 29, 1892. Serial No. 431,104. (



Claim.—In combination, a button, a spr
jaw secured to the button so as to swing, a
the fixed jaw, a nose projecting from the
cured to the fixed jaw, and having a head t
the nose on the movable jaw for yieldingly
in its open or closed positions, substantially

489,627. TICKET-HOLDER.

Philo
Filed Feb. 21. 1891. Serial No. 382,298. (



icket holder, the combination of a frame hav-
on which the ticket is supported, and an open-
l face for permitting inspection of said ticket,
wheel journaled in the frame and formed with
ally beyond said face and movable beneath the
moved along said face, and a spring stop for
vement of the canceler or wheel, substantially
specified.

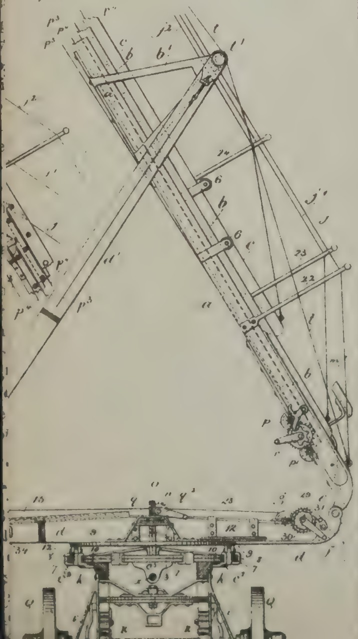
er, the combination of a frame having a bearing
ticket is supported, and an opening directly
mitting inspection of the ticket, a movable can-
teeth projecting beyond said face, a stop con-
described, to the canceler or wheel for pre-
in one direction, and a second stop for engaging
eventing its operation, substantially as and for

er, the combination of a frame having a bearing
ticket is supported, and an opening directly
nitting inspection of the ticket, a movable can-
teeth projecting above said face formed with
lining rearwardly, a stop for preventing move-
r wheel in one direction, a second stop or cam
op, and a spindle for rotating the latter stop
s and for the purpose set forth.

er, the combination of a frame having a bearing
ket is supported, and an opening directly above
g inspection of the ticket, a pair of movable
ving teeth projecting above said face and pro-
spindle, a ratchet wheel on the spindle, and a
ng the teeth of the ratchet wheel, substantially
specified.

er, the combination of a frame having a bearing
ket is supported, and an opening directly above
g inspection of the ticket, a pair of separated
vheels having teeth projecting above said face
ommon spindle, a ratchet wheel on the spindle,
r engaging the ratchet wheel, a stop or cam
or dog out of operative position, and a spindle
nd stop or cam, substantially as and for the

-LADDER. RODRIGUE COLLERET, Montreal, Canada.
Serial No. 435,588. (No model.) Patented in Can-
a 37,670.



the rails, a barrel and cables or ropes extending from the barrel to the base of the prop-bars for moving the same along and elevating the extension ladders, rack teeth upon the frame and pawls for holding the ladders in their elevated positions, substantially as set forth.

2. The combination with the extension ladders, one sliding upon the other, of ropes or cables, pulleys at the upper ends of the ladders over which such ropes or cables pass and winch barrels, mechanism for revolving the same and sliding cylindrical couplings engaging projections on the winch barrels and to which the cables or hoisting ropes are connected, and means for holding such ladders when elevated, substantially as set forth.

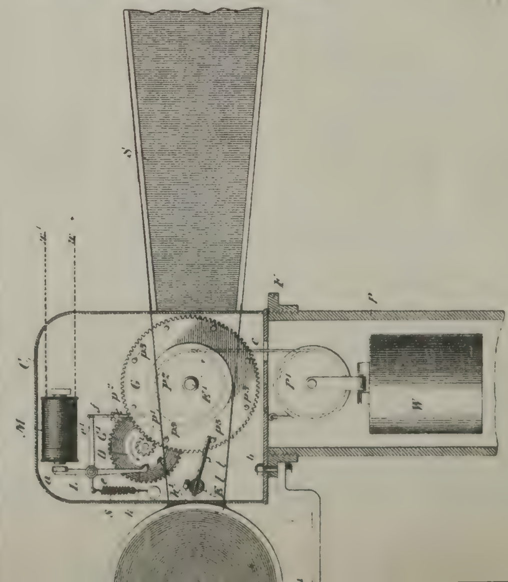
3. The combination with the extension ladders, of a frame and trucks for supporting the same, a secondary frame to which the ladders are hinged, prop-bars and mechanism for operating the same to raise the ladders, a turn table for connecting the primary and secondary frames and adjusting screws and cog nuts and one cross shaft for actuating the nuts simultaneously and in opposite directions for leveling the secondary frame and ladders, substantially as set forth.

4. The combination with the main frame and a truck for the same, of a secondary frame, ladders connected to the secondary frame, a turn table connecting the primary and secondary frames, a longitudinal adjusting screw for moving the turn table and secondary frame lengthwise of the main frame, and screws for bringing the secondary frame and ladders into a level position, substantially as set forth.

5. The combination with the main frame and a truck for the same, of a secondary frame, ladders connected to the secondary frame, a turn table connecting the primary and secondary frames, a longitudinal adjusting screw for moving the turn table and secondary frame lengthwise of the main frame, screws for bringing the secondary frame and ladders into a level position, and a swinging strut or leg connected with the secondary frame near the end thereof, and a screw for supporting such secondary frame when swung into an angular position across the main frame, substantially as set forth.

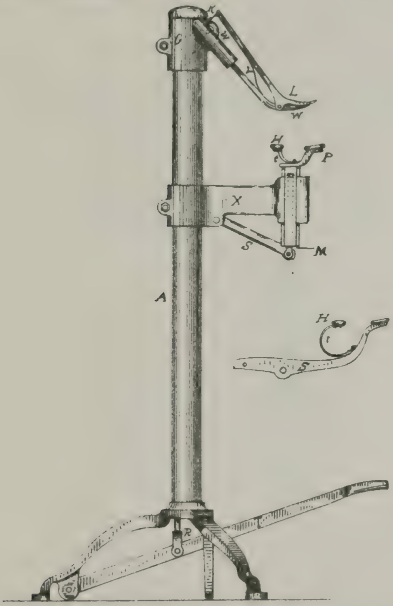
6. The combination with the extension ladders and the primary frame and trucks for supporting the same, of the secondary frame and a turn table composed of three rings, the lower one of which rests upon the main frame, an intermediate ring connected to the lower ring by clips, and an upper ring permanently connected to the secondary frame and hinged to the intermediate frame, screws for adjusting the upper ring and secondary frame in relation to the lower rings, and means for adjusting the turn table longitudinally of the main frame, substantially as set forth.

489,629. **RAILWAY-SIGNAL.** WILLIAM F. Z. DESANT, New York, N. Y., assignor to the Desant Electric Company, same place. Filed Apr. 25, 1892. Serial No. 430,610. (No model.)



a retarding device as a fly fan rotated by the same train, a notched controlling disk and an electro-magnet provided with an armature lever having two arms one of which checks the fly fan while the other regulates the movements of the semaphore arm, substantially as described.

489,630. BOOT OR SHOE CREASER. Reuel F. Gordon and Greenfield T. Davis, Auburn, Me. Filed Nov. 3, 1892. Serial No. 450,806. (No model.)



Claim.—1. In combination with each other and with a vertically movable creasing last, a standard, a piece rigidly attached thereto which is adapted to enter a shoe and press against the sole, a movable support which is pressed against the outside of the sole, a treadle or lever and means of connection which transmit pressure from the treadle or lever to the sole through the movable support.

2. The combination of a standard, a vertically movable creasing last, a movable support for the sole of the shoe, a treadle or lever, means for simultaneously transmitting motion from the treadle or lever to the movable last and movable support, and a piece rigidly attached to the standard which is adapted to enter a shoe and press against the sole.

3. The combination of a lever or treadle, a movable support for the sole of the shoe, an elastic connection between the treadle or lever and the support, a vertically movable creasing last. an elastic connection between the lever or treadle and the last, and a rigid piece which enters the shoe and reacts against the motion of the movable support and of the movable last.

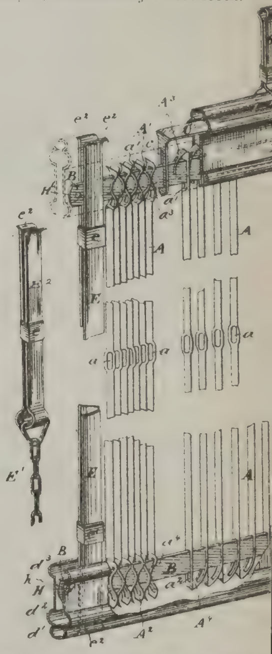
4. The combination of a rigidly fixed piece which is adapted to enter a shoe and press against the sole, a movable creasing last which reacts against this piece, a movable support which presses against the under side of the sole. A lever or treadle elastically connected with the movable support and with the movable creasing last, and a catch capable of holding the lever or treadle in place when pressed downward.

5. In a boot or shoe creaser the combination with a vertically movable creasing last, of a rigidly supported piece which is adapted in shape to enter a shoe and press upon the sole, a movable support which can be pressed against the under side of the sole, means of transmitting pressure to this support, a second movable support which can be pressed against the heel and an elastic connection which transmits pressure from the first to the second of these supports: all as set forth

489,631. HEDDLE AND HEDDLE-FRAME FOR LOOMS. Julius Grob, Horgen, Switzerland, assignor to Grob & Co., same place. Filed

passing through the mortises of the heddle tubular bars having longitudinal ribs, and a tised for the bars and passing within the longi lar bars, substantially as set forth

3. The combination with the heddles ha contiguous springs to separate the heddles of the mortises, the end bars E adapted to rece bands *e* upon the end bars E for clamping th tubular bar D having longitudinal ribs into wh E are received, substantially as set forth.



4. The combination with the heddles ha ends and contiguous springs, of the bars B pass the supporting pieces C through which the bars D having longitudinal ribs and receivin of the heddles, the bars B and the suppor their sliding bands *e*, adapted to pass at opp and having outwardly turned ends e^3 for p tudinal ribs of the bars D, substantially as se

5. The combination with the heddles h end mortises and adjacent springs, of the ba mortises of the heddles, the inclosing tubular nal ribs, and the harness clutches G adapted bars D, substantially as set forth.

489,632. PROCESS OF REGENERATI Gruessner, Chicago, Ill., assignor of one-four place. Filed Aug. 15, 1892. Serial No. 443

Claim.—1. The method of regenerating solutions which consists in mixing with the metastannic acid and applying heat to the m

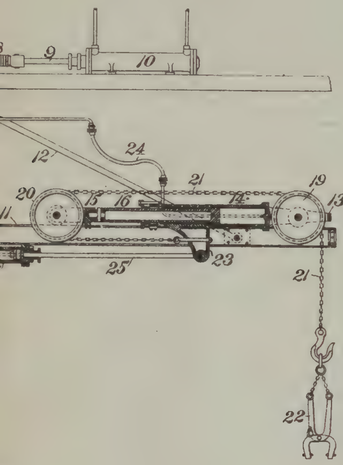
2. The method of regenerating electro used for refining purposes, which consists in and the like, therefrom, by mixing suitable acid with such electrolyte and then applying by the combination of the metastannic ac like and precipitated.

489,633. PROCESS OF RECOVERI Frank Gruessner, Chicago, Ill., assignor o Badt, same place. Filed Aug. 15, 1892. Se mens.)

Claim.—The process of recovering me

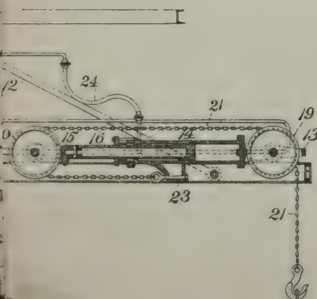
nted horizontally on said jib and a gripping exible connection to said cylinder, substantially

combination of a jib, a lifting cylinder mounted ɔ, and a stationary fluid pressure cylinder for nder, substantially as set forth.



combination of a jib, a movable fluid pressure ontally on said jib, wheels movable with the der and with the cylinder respectively, and a ending from the gripping mechanism around ted to the cylinder, substantially as set forth.
combination of a jib, a fluid pressure cylinder heels movable with the piston rod of said cylnder respectively, a flexible connection extendnechanism around said wheels and connected eans for shifting said cylinder along the jib, h.
combination of a jib, a fluid pressure cylinder heels movable with the piston of said cylinder respectively, a flexible connection extending hanism around said wheels and connected to onary fluid pressure cylinder secured to the jib ylinder, substantially as set forth.
ombination of a jib, a lifting cylinder mounted ylinder having a piston rod connected to the mounted on the ends of the piston rods of the nders, respectively, and a flexible connection ping mechanism around said wheels and conlinder, substantially as set forth.

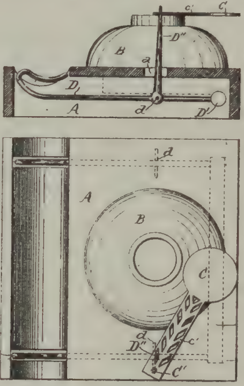
NE. **James Hemphill** and **Joseph Fawell**, Pitts-
y 14, 1892. Serial No. 440,002. (No model.)



2. In a crane the combination of a jib, a lifting cylinder arranged on said jib, and a fluid pressure cylinder for shifting the lifting cylinder along the jib, and connected to said lifting cylinder and movable therewith, the piston rod of the shifting cylinder being attached to a stationary part of the crane, substantially as set forth.

3. In a crane, the combination of a jib, a lifting cylinder arranged on said jib, a fluid pressure cylinder attached to the lifting cylinder, and a hollow stationary piston rod extending through the shifting cylinder, and having its ends connected to fluid supply pipes and provided with openings within the cylinder and on opposite sides of the piston, substantially as set forth.

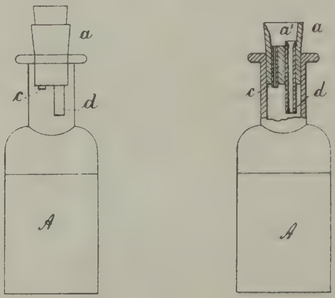
489,636. INKSTAND. Andreas Hillgren, Geneva, Switzerland. Filed Apr. 21, 1892. Serial No. 430,035. (No model.)



Claim.—1. The combination with the ink bottle, of a hollow stand or base, levers and a counter weight within the base, such levers projecting up through slots in the hollow base to receive the pen and a cover and an arm connected with one of the levers to swing the cover horizontally substantially as specified.

2. The combination with the ink bottle, of a hollow stand or base, levers and a counter weight within the base, such levers projecting up through slots in the hollow base to receive the pen and a cover pivoted upon the hollow base and an arm connected with one of the levers to swing the cover horizontally substantially as specified.

489,637. BOTTLE-STOPPER. Franz L. von Hirsch, Dusseldorf, Germany. Filed May 27, 1892. Serial No. 434,660. (No model.)

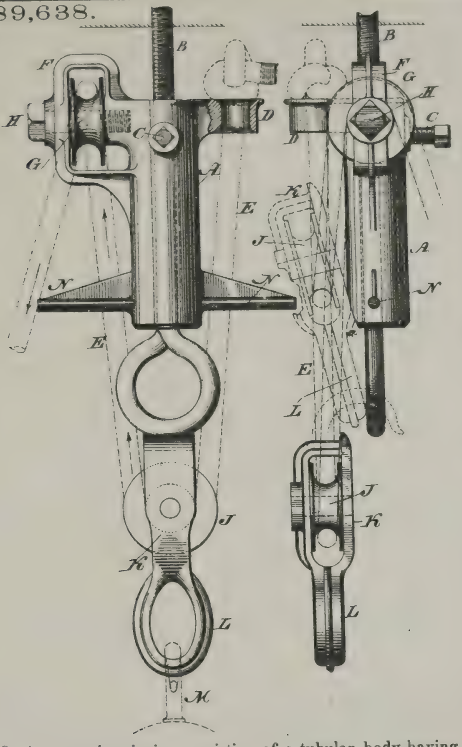


Claim.—The combination of a bottle with a perforated stopper having mortise a', a pair of tubes of unequal length projecting through the stopper into the bottle and with a plug k, adapted to be received by the mortise, substantially as specified.

489,638. SUSPENSION DEVICE. William C. Jennings, Camden, N. J., assignor to the Jennings Machine Company, of New Jersey. Filed Apr. 25, 1892. Serial No. 430,480. (No model.)

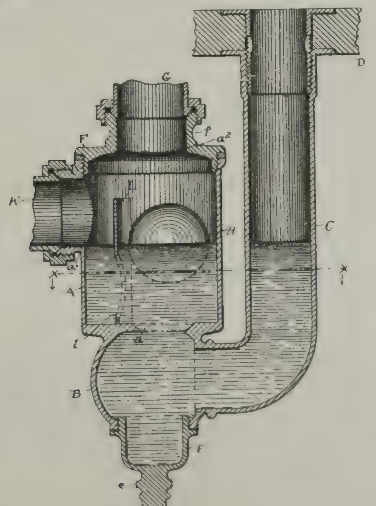
Claim.—1. A suspension device consisting of a body, an eye and

489,638.



3. A suspension device consisting of a tubular body having an eye and a yoke on opposite sides at one end, cleats projecting from the other end, a pulley journaled in said yoke, a securing screw adjustably secured in said tubular body, said body having a beveled lower end, said parts being combined substantially as described.

489,639. SINK OR BASIN TRAP. WILLIAM KERR, Cleveland, Ohio. Filed Oct. 10, 1892. Serial No. 448,339. (No model.)

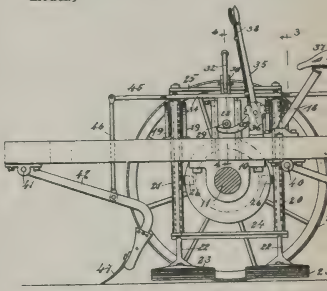


Claim.—1. A sink or basin trap having a cylindrical body with an inlet opening in its bottom and an outlet opening in its side, a diaphragm between said openings having a passage through it, and a ball valve in position to seat in said passage and the inlet opening,

having an inlet opening in its bottom, an out
back vent opening in its top, and a diaphrag
the center of said body before the outlet op
for the fluid, and a ball valve in said body; su

4. The body A having opening *a* and in
and the outlet *a′* in its side, the cap F closi
the diaphragm L extending part way the le
said body and having a fluid passage throug
in position to seat on said passage and the
vent opening a^3, substantially as described.

489,640. COTTON CHOPPER AND C
NOLAN, Jacksonville, Fla. Filed Dec. 3, 1891
model.)



Claim.—1. In a cotton chopper or like
tion, with the axle, supporting wheels mount
nection between the wheels and axle, and a
provided with a continuous, peripheral ca
located at each side below the drum, handl
the upper ends of which are connected tog
and pins connected with the hoe handles a
of the drum, one at each side of the latter, s
purpose set forth.

2. In a cotton chopper or like impleme
a rotating drum provided with a circum
groove, of tubes pivotally held at their uppe
side of the drum, hoe handles held to slide i
from the tubes into the cam groove of the
connection between the lift-lever and the
as and for the purpose set forth.

3. In a cotton chopper or like impleme
the axle, supporting wheels mounted there
between the wheels and axle, and a dru
provided with a continuous, peripheral ca
one at each side of the drum and pivotally
pins projected from the tubes into the gro
dles loosely held in the tubes, an adjustab
tion between the lift lever and the hoe han
effected above the tubes in which the han
the purpose set forth.

4. In a cotton chopper or like implem
the axle, supporting wheels mounted the
between the wheels and the axle, a drum s
vided with a continuous, peripheral cam
one at each side of the drum, pivotally he
free to move at their lower ends, the said
pins entering the groove of the drum, of h
the tubes, lift blocks having sliding moven
plement, a shaft operating to raise the lift
carried by the frame of the implement, a
blocks and connected with the shanks, a
nected with the lift blocks, a link connecti
hoe handles, and a shifting lever connected

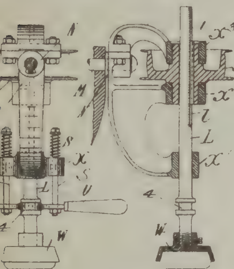
5. In a cotton chopper, the combinati
and a drum mounted therein and provid
tubes pivoted in the frame and provided
groove of the drum, hoe handles sliding
together, a pivoted and adjustable lever
hoe handles with the said lever, substanti

6. In a cotton chopper, the combinati
and pivoted cultivator shanks, of blocks

or operating the hoe handles, of blocks sliding and provided with vertical brackets, a lever said brackets and having its other end adjust- bracket, a link connecting the hoe handles with ided with fingers engaging the sliding blocks, ng the shaft, substantially as herein shown and

---

HINE FOR WORKING LEATHER. **Adam Probst,** assignor to Doerr & Reinhart, same place. Filed ial No. 444,226. (No model.)

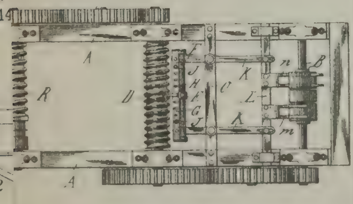


bination, the swinging frame, the bolt M ex- rough the end of said frame, the bracket K olt, the bearings on the said bracket arranged e tool shaft L passing loosely through the said y J on the said vertical shaft between two of ubstantially as described.

, the swinging frame, the bolt M arranged hori- e frame and having a projection *n*, the bracket e N arranged to swivel on the bolt and have nt, the bearings on the bracket arranged one rtical tool shaft passing through the bracket y on the vertical shaft between the bearings, ed.

, the swinging frame, the bracket swiveled at e lateral swinging movement, the vertical tool hrough the said bracket to have vertical ad- wiveled on the lower part of the said shaft, the on each side of the shaft from the handles the bracket and the springs S on said rods se the handles, substantially as described.

ARATUS FOR AUTOMATICALLY GUIDING SKIN NES FOR MAKING LEAF METAL. **Christian** Germany. Filed June 1, 1892. Serial No. 435,183.



bination, the holder U, the lever carrying the , the table having a convolute groove into the shaft at the central part of the groove the nd projecting laterally therefrom over the rm having sliding connection with the pin of perating the shaft, substantially as described.

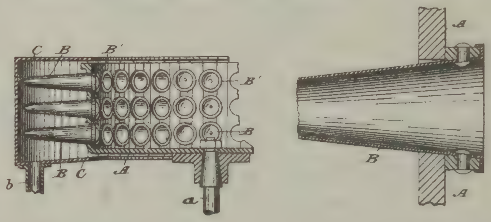
3. In combination, the holder, the pivoted lever carrying the same, the pin on the lever, the table having a convolute groove to receive the said pin, the shaft at the central part of the said convolute groove, the laterally extending arm connected to said shaft and having a sliding connection with the pin the gearing for operating the shaft and the reversing mechanism therefor, substantially as described.

4. In combination, the holder, the pivoted lever carrying the same, the pin on the lever, the table having a convulate groove to receive the said pin, the shaft at the central part of the groove, the arm extending laterally therefrom, and having sliding connection with the pin and the speed changing driving mechanism and reversing devices for operating the shaft, substantially as described.

5. In combination, the holder, the pivoted lever carrying the same, the pin on the lever, the table having a convolute groove to receive the said pin, the shaft at the central part of the groove, the arm extending laterally from said shaft and having a sliding connection with the lever pin, and the driving mechanism for the said shaft including the cone drum and the winding cords, substantially as described.

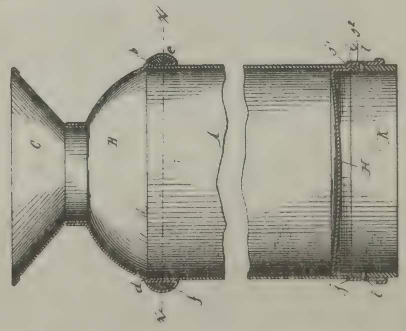
6. In combination, the holder U, the lever carrying the same, the plate having a convolute groove to receive a pin on the lever, the shaft having an arm thereon in sliding connection with the pin, and the driving mechanism for the said shaft including reversing devices, said devices comprising the spiral drum R, the slide E, the adjustable stops, the belt shifters and the connections thereto from the stops, substantially as described.

489,643. CENTRIFUGAL MACHINE. **Carl Steffen,** Vienna, Austria-Hungary. Filed Aug. 3, 1888. Serial No. 281,918. (No model.) Patented in Germany June 16, 1888, No. 49,120.



Claim.—In combination with a rotary drum A provided with a series of perforations in its periphery, sleeves *a′* fitting said perforations and held therein against the centrifugal action, said sleeves having cone shaped openings and the conical molds B having a shoulder overlapping the end of the sleeve, substantially as described.

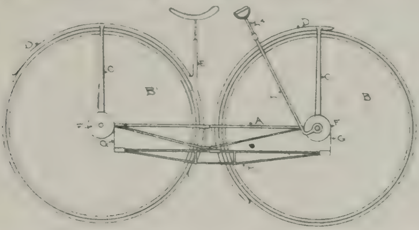
489,644. MILK-CAN. **Augustus F. Tripp,** Buffalo, N. Y., assignor to Sidney Shepard & Co., same place. Filed July 7, 1892. Serial No. 439,307. (No model.)



Claim.—1. The combination with the cylindrical can body, of the breast having at its lower end a straight cylindrical rim which overlaps and rests against the outer side of the upper portion of the can body and which is provided at its lower edge with an outwardly and upwardly turned annular flange, and a reinforcing ring confined between said rim and flange and bearing with its outer face against the inner side of said upwardly turned flange and with its portion against the outer side of the rim and resting with its lower edge upon the shoulder thereof, substantially as set forth.

3. The combination with the bottom of the can having a depending marginal rim provided below the bottom with an outwardly projecting annular offset forming an external upper shoulder and an internal lower shoulder, of the cylindrical can body overlapping the depending rim of the bottom and resting with its lower edge upon said external upper shoulder, and a base ring arranged within said rim and bearing with its upper edge against said internal lower shoulder, substantially as set forth.

489,645. VELOCIPEDE. JOSEPH F. WHITAKER, Hartford, Conn. Filed July 21, 1891. Serial No. 400,259. (No model.)



Claim. 1. The combination of the front and rear wheels with their spring recoil drums and straps, the frame for supporting said wheels hinged at a point between them, and the pedal bars connected with the straps from both wheels, substantially as described and for the purpose specified.

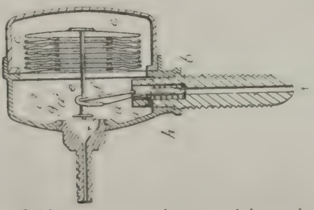
2. The combination of a hinged frame with wheels mounted thereon, with a steering frame having sliding handles, substantially as described and for the purpose specified.

3. In a vehicle, the combination of the spring recoil drums, two sets of straps, and two sets of operating devices, the outer end of one strap from a single drum being connected with one of said operating devices, while the outer end of the other strap from the same drum is connected with the other of said operating devices, substantially as described and for the purpose specified.

4. The combination of the wheels mounted on a suitable frame and provided with spring recoil driving drums and straps, pedal bars connected therewith for being depressed with the feet, and pulls also connected with said drums for being pulled by the hands in the reverse direction from that given the pedal bars, substantially as described and for the purpose specified.

5. The combination of a hinged frame with wheels mounted thereon, and provided with recoil drums, a steering frame having sliding handles and devices for connecting said sliding handles with said drums, substantially as described and for the purpose specified.

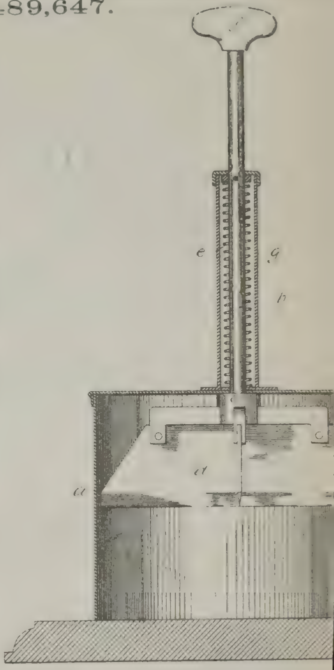
489,646. FLUID-PRESSURE REGULATOR. HENRY BRIER, Crosshill, Scotland. Filed Aug. 17, 1892. Serial No. 443,335. (No model.) Patented in England Sept. 18, 1890, No 14,725, and in France Nov. 5, 1891, No. 209,319.



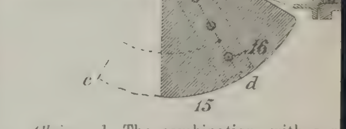
Claim.—In a fluid pressure regulator, an inlet and exit opening a valve in the exit opening and controlling means therefor, acted on by the pressure, consisting of a central rod connected to an expansion device, as a bellows, a link *a* having one end bifurcated and pivoted to the casing and connecting with the rod at the other end, said end being hooked, and a link *f* fitting the hooked end of the link *a*, and engaging a notch in the valve in the exit opening, substantially as described.

489,647. CULINARY CHOPPER. JOHN B. COE, Boston, Mass.

489,647.



489,648. COUNTERBALANCE AND G ING MECHANISMS. MATTHIAS N. FORNEY Mar. 31, 1892. Serial No. 427,227. (No mo



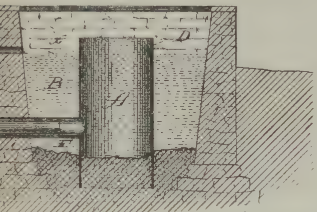
Claim.--1. The combination. with a r mechanism, of an articulated system of oscilla nected to the reciprocating element and fo rectilineal motion thereof, a guiding member and a counterbalance connected to said syst in opposite direction to the reciprocating ele forth.

2. The combination, with a reciprocatin of a primary oscillating lever coupled at one element and having a movable fulcrum at it armed secondary lever, oscillating in fixed of its arms pivotally connected to the prir thereof, and a counterbalance connected to secondary lever, substantially as set forth.

3. The combination, with a reciprocatin of a primary oscillating lever coupled at one element and having a movable fulcrum at i armed secondary lever, oscillating in fixed of its arms pivotally connected to the prir thereof, and a dead weight connected to the ondary lever, substantially as set forth.

4. The combination, with a reciprocatin

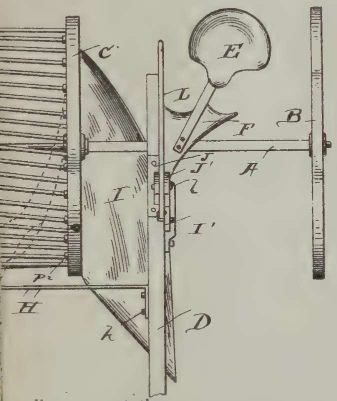
G PROTECTION. **HENRY A. GARBEN**, Chicago, Ill. Serial No. 445,761. (No model.)



ination with a spring, a well, and a shell in ng, forming a direct-supply or primary reser- and forming with the surrounding elevation the well, substantially as and for the purpose

ith a spring A, a well having masonry walls tal tube D sunk into the base of the well y forming a primary reservoir for the spring the said walls a secondary reservoir B in the E leading from the reservoir D, substantially t forth.

O-DIGGER. **JAMES A. HOGG**, Independence, and eveland, Ohio. Filed May 16, 1892. Serial No



ato-digger, a rotating-cage or screen com- or rounds connecting said wheels, said rods oblique to a plane radial with the axis of tantially as indicated, whereby said rods or rd the delivering-end of the cage or screen the latter, substantially as and for the pur-

er, a rotating-cage or screen composed of ls or rounds near their periphery, said rods d in two series concentric with each other, of the one series intervening between the r series, substantially as and for the purpose

er, a rotating-cage or screen composed of s or rounds near their periphery, said rods nearer to the periphery of the wheel at the e than to the periphery of the wheel at the substantially as and for the purpose set forth.
er, a rotating-cage or screen composed of hereof in cross-section, are of the shape of or rods connecting said wheels and secured he inverted-L-shaped rims of the wheels, the of the wheel at the delivering or discharg- cut away, as at C^6, substantially as and for

r, a rotating-cage or screen composed of hereof in cross-section are of the shape of ncentric series of rods or rounds, arranged and connecting said wheels, said rounds or

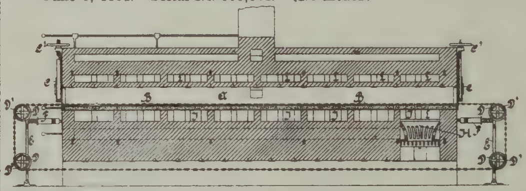
6. In a potato-digger, a rotating-cage or screen composed of wheels C′ C^2 and rods or rounds connecting said wheels, said rods arranged in concentric series the parts being rigidly secured together substantially as shown and for the purpose specified.

7. In a potato-digger, in combination with the draft-pole, and the axle, A, of a plate, as at F, bolted to the draft-pole and supporting the seat, said plate being recessed, as at *f′* to partially embrace the axle, and a clip or strap, G, substantially as and for the purpose set forth.

8. In a potato-digger, the combination with the draft-pole and the plow, of a clip or strap pivoted to the draft-pole, the plow having an arm or member extending upwardly through said clip or strap and a lever, as at L, attached to said arm, the arrangement of parts being such that the plow may be tilted vertically in the one direction or the other according to the direction in which the clip or strap is turned, and suitable means for securing said clip or strap in the desired adjustment of the parts, substantially as set forth.

9. In a potato-digger, the combination with the draft-pole and the plow, of a clip or strap pivotally connected to the one side of the draft-pole and provided with a slot, as at *k′*, concentric with the pivot, the draft-pole being provided with a stud-bolt extending through said slot, a nut mounted on said bolt outside the clip or strap, the plow having an arm or member extending upwardly through said clip or strap, and a lever attached to said arm, all substantially as and for the purpose set forth.

489,651. OVEN. KARL K. KARLSTÉEN, Stockholm, Sweden. Filed June 9, 1891. Serial No. 395,671. (No model.)

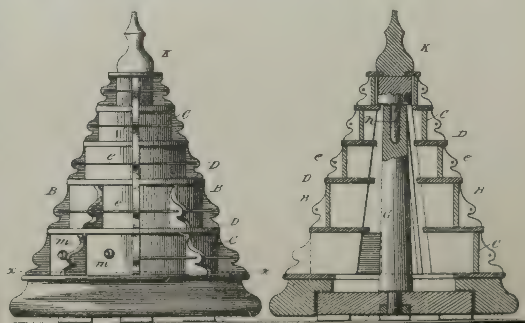


Claim.—1. A baker's oven having in combination with a baking chamber open at both ends, an endless wire-gauze bread-carrier, and guide-rollers for such carrier outside of such chamber and serving to move this carrier near the bottom of this chamber and through it, and then back outside of and under the oven and fire-place, all substantially as set forth.

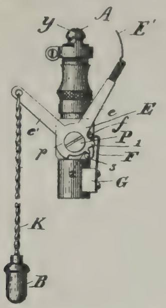
2. A baker's oven having in combination with a baking chamber open at both ends, and with an endless wire-gauze bread-carrier moving through this chamber near its bottom and then back under the oven and fire-place, adjustable stretching rolls outside of such chamber supporting such wire-gauze and serving to stretch it and for bringing it into movement.

3. In an oven having its baking chamber open at both ends, the combination of an endless wire-gauze carrier extending through such open ends and over the fire-place, stretching rolls for such carrier, supports therefor, provided with spiral springs, and regulating screws, whereby the rolls can be removed to or from the oven ends, and the wire-gauze carrier stretched as need be, all substantially as set forth.

489,652. PRESCRIPTION-CASE. JAMES LAMB, Aurora, Ind., assignor to Lamartine K. Lamb, Tolono, Ill. Filed Mar. 25, 1892. Serial No. 426,403. (No model.)



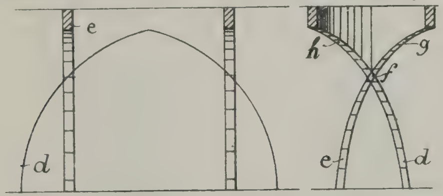
489,653. ELECTRIC GAS-LIGHTER. **THOMAS W. LANE**, Boston, Mass., assignor to the Electric Gas Lighting Company, Portland, Me. Filed Jan. 25, 1892. Serial No. 419,164. (No model.)



Claim.—1. In a hand lighting electric gas burner, the combination of the burner A, fixed electrode Y, two-armed lever E, having a vertical arm e, and a horizontal e', and projections 1 and 2, a tilting gas-cock P, rigidly attached to said two-armed lever at about the angle thereof, a wire K, attached to the horizontal arm e', a contact point upon the vertical arm e, adapted to make contact with the fixed insulated arm Y, a leaf spring F mounted upon the block G, and a stop 3, all constructed and combined as and for the purposes set forth.

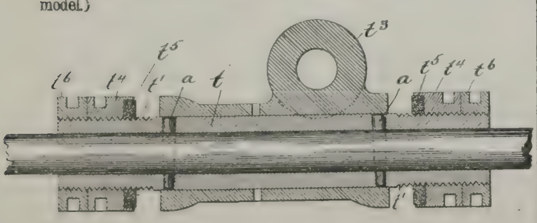
2. In an electric hand lighting gas burner having a fixed electrode and a two-armed angle or bell-crank lever rigidly attached to the gas-cock and carrying the movable electrode, the combination of a lever-handle for moving said two-armed lever with a leaf spring attached to the burner body, and its free end adapted and normally tending to hold the gas-cock in either an open or in a closed position and to be strained only during the opening or closing of the gas-cock, all substantially as described.

489,654. ARCH FOR CEILINGS OR VAULTS. **GOTTHILF L. MÖCKEL**, Doberan, Germany. Filed May 31, 1892. Serial No. 434,991. (No model.) Patented in Germany June 9, 1891, No. 62,591.



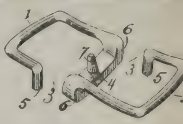
Claim.—In the construction of ceilings and vaults: The arches d e, springing from the foundation at different points, intersecting at a certain height, and being both continued upward beyond the point of intersection, for the purpose as described.

489,655. TAPPET FOR DUPLEX STEAM PUMPING-ENGINES. **MOSES M. MOORE**, Beloit, Wis., assignor to the Eclipse Wind Engine Company, same place. Filed July 28, 1892. Serial No. 441,502. (No model.)



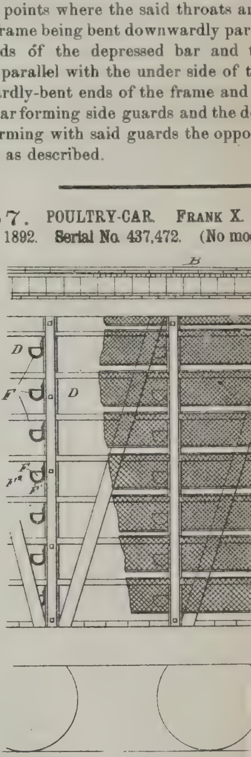
Claim.—The combination of the valve-rod with the sleeve t, fastened upon it, and externally screw-threaded at both ends; the nuts t^4, screwed upon the sleeve, and provided with means for locking them in any adjusted positions; and the tappet-head t^2, fitting and sliding upon the sleeve between said nuts, and actuated from the piston; substantially as described.

489,656.



said bar being extended and connecting with
frame at the points where the said throats a
ends of the frame being bent downwardly par
extended ends of the depressed bar and
zontal plane parallel with the under side of t
said downwardly-bent ends of the frame and
ends of the bar forming side guards and the d
the frame forming with said guards the oppo
substantially as described.

489,657. POULTRY-CAR. **FRANK X.**
June 21, 1892. Serial No. 437,472. (No mo



Claim.—1. In a live-poultry car divided
coops separated by a longitudinal aisle, and
having openings r, a trough for each coop, a
supported to coincide with the said opening a
with its inner end at the said opening and a
for, substantially as described.

2. In a live-poultry car divided internally
rated by a longitudinal aisle, and provided wi
ings r, supports for troughs in the coops at
troughs on said supports and each formed
hinged together, substantially as described.

3. In a live-poultry car divided internally
rated by a longitudinal aisle, and provided wi
ings r, trough-supports F^2 in the coops at th
ary shields F' on the said supports, and trough
with their inner ends affording closures for
formed in longitudinal sections hinged toge
scribed.

4. In a live-poultry car divided internall
rated by a longitudinal aisle, the combinatio
E having openings r for the troughs and pr
frame-pieces p with elongated openings o th
ing-journals n pass, door-catches l on the si
ported in the coops to close at their aisle-e
stantially as and for the purpose set forth.

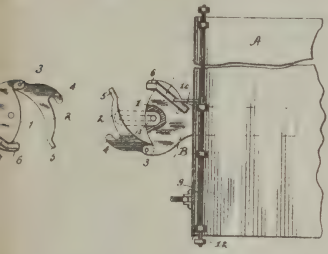
489,658. STRAIN-INSULATOR. **LOU**
Filed June 29, 1892. Serial No 438,411.

ulator comprising a case adapted to hold a , a metallic connecting piece placed therein, f mica surrounding said piece and adapted to said case, a sleeve *h* secured within said case d with a screw threaded bolt or connecting eeve is turned the connecting piece may be the sleeve to tighten or loosen the supporting t forth.

he combination of the case A, a metallic conerein, and insulated therefrom by a series of k *g*, sleeve *h* and bolt *m*, substantially as set

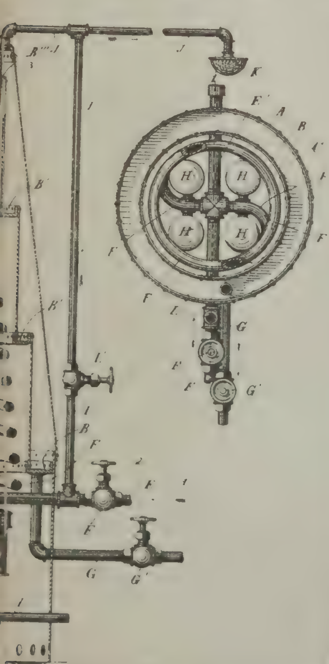
---

OUPLING. **Lemuel Parmley**, Momence, Ill., as- William B. Brown, Crown Point, Ind. Filed Feb. 19,915. (No model.)



pler comprising a draw-head and a horizonm having corresponding flat meeting faces, a pon the outer face of said locking arm, and a th said locking arm.

INED WATER-HEATER AND SHOWER-BATH. Rapids, Mich., assignor of one-half to George B. Filed July 14, 1892. Serial No 440,068. (No



r heater, the combination with the tubular ters, cups at the ends of said sections, and d sections and cups, of the spiral coils ex- the lower of said sections and having their t to the exterior of the upper of said sec-

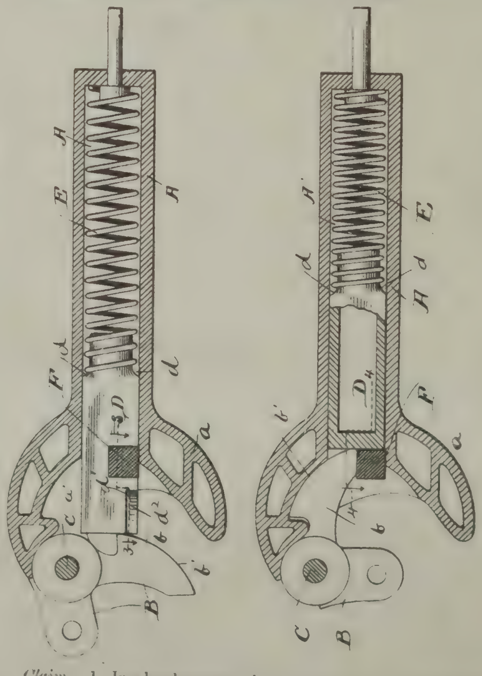
side adjacent to one of said tubular sections, substantially as described.

3. In a water heater, a cylindrical casing, having burners or other heating devices within the same, a tubular conical extension attached to said base, a series of upwardly diminishing tubular sections connected by upwardly open annular cups within said conical extension, a head connecting said extension to the upper tubular section, a transverse pipe in said casing above said heaters, conical spiral coils connected to said pipe and extending upward within said tubular section and cups, said coils passing through the upper cup and having lateral openings in the side adjacent to the upper tubular section, and a discharge pipe attached to the lower annular cup, substantially as described.

4. The combination, in a combined water heater and shower bath, of a casing, tubular sections of different diameters located in said casing, cups at the ends of said sections, the burners, spiral coils extending upward within said tubular sections and having their upper ends located adjacent to the exterior surface of the uppermost section and formed with lateral openings, a permanently-open pipe, J, extending from the upper end of said casing and provided at its outer end with a sprinkler, a valved pipe G extending from the lower cup, a valved pipe E connected with the lower ends of said coils, and a valved pipe L connecting said pipes J and E.

5. A combined water heater and shower bath, consisting of a series of upwardly diminishing tubular sections, annular cups connecting the adjacent ends of the same, a truncated conical outer shell connected to the outer rim of the lower cup at its base and to the upper tubular section at its smaller end, burners in said casing conical spiral coils within said sections and cups, said spiral coils extending through the uppermost cup and having series of openings in their sides adjacent to the uppermost tubular section, a permanently-open pipe, J, extending from the upper end of said casing and provided at its outer end with a sprinkler, a valved pipe G extending from the lower cup, a valved pipe E connected with the lower ends of said coils, and a valved pipe L connecting said pipes J and E.

489,661. CAR-COUPLING. **Thomas W. Ranson**, Hornellsville, N. Y. Filed July 16, 1892. Serial No. 440,202. (No model.)



Claim.—1. In a hook car-coupler, the combination with the draw-bar and draw-bar-head, chambered substantially as described, and a knuckle pivotally connected with the draw-bar-head, of a sliding-block or plunger adapted to move endwise of the chamber of the draw-bar and engage and hold the knuckle in open position preparatory to

Boston Public Library
Central Library, Copley Square

Division of
Reference and Research Services

The Date Due Card in the pocket indicates the date on or before which this book should be returned to the Library.

Please do not remove cards from this pocket.

BOSTON PUBLIC LIBRARY
3 9999 08849 328 1